
POPULAR Computing WEEKLY

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Vol 4 No 12

Amiga guns for the ST

COMMODORE's 68000-based Amiga microcomputer seems likely now to be launched in this country before the end of the year

The machine features 256K Ram, 128K Rom, and is expected to be priced in the US between $700 and $900 The UK price will be determined by the fluctuations of the pound, against the dollar, but is expected to be well under £1000

At that price the machine should include a 1M capacity single disc drive and colour monitor built-in A number of UK companies, including Metacomco, have already expressed an interest in writing software for the Amiga.

However, Commodore's Gail Wellington pointed out that specification details may change between now and the launch date "The date of launch has not been finalised but it could be the very end of 1985," she said "As far as details such as built-in peripherals are concerned, it would be easy to alter these as we work on it I would expect the specification to become more fixed around May, when the final versions are produced "

The machine is a competitor for Atari's ST micro and Commodore's intention is that the Amiga will out-perform the ST, particularly with regard to its graphic capabilities Atari earlier this year took out a law suit against Amiga – the company which developed the machine, which was then bought by Commodore – over the development of one particular graphics chip Daphne, said to have been commissioned for Atari

● Commodore is launching its IBM-PC compatible machine this week The 8086-based machine designed for the European market only is expected to be much cheaper than many other PC compatibles

Pocket micros

toys or tools?

see page 17



First mouse for the Commodore 64 – see page 4 ▶

Decision on Oric's future imminent

A DECISION is expected this week from the receiver over the future of Oric Products International.

Last weekend was the final deadline for offers to buy the company, and the receiver, David Crose of Charter and Myhill, is confident that a suitable buyer will be found

"I am hopeful that the company will be sold as a going concern,' he said.

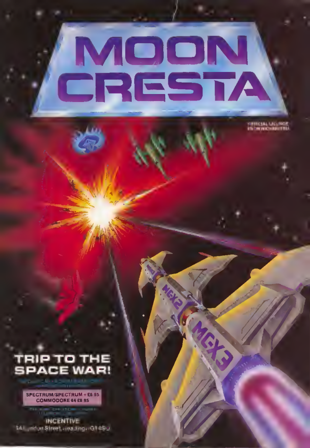
However, like Acorn and Dragon Data it may not be a British company that is successful A French company, Spid, has tendered a bid, and an ex-director of Oric's French distributors, ASN, M Dannis Tareb heads another offer

Eurohard SA, the Spanish firm which bought Dragon Data is also said to have been talking to the receiver but it is thought a formal bid was not made

However, there is British interest in the future of Oric in the shape of a bid by a consortium led by ex managing director Barry Muncaster and

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INSIDE ⟩ IN FLIGHT INFORMATION – FIREBIRD PROFILE, SEE P11 ⟩


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View

After all the excitement in January with both Atari and Commodore announcing new machines – and after the problems at Oric and Acorn – things have suddenly gone very quiet.

Industry and shoppers alike are holding back, waiting to see what impact the new machines will have. Only the QL and Amstard CPC464 seem to be attracting much new hardware and software.

The first of the new micros to arrive in the shops looks like being Amstrad's CPC664. This should be followed by Atari's 128K model of its ST and shortly after, Commodore's C128.

After that comes the 256K and 512K ST's, Atari's 130 XE rival for Commodore's C128 and Commodore's own second 128K model with built-in disc drive, the C128D. Finally, after all that, later in the year we will get Commodore's 68000-based rival for the ST, the Amiga. And around January of next year Sinclair is thought to be planning the second of its QL machines – an up-market variation to compete with the top end ST's and the Amiga.

With all this hardware on the way it isn't any wonder that things have slowed considerably. In fact the current caution exactly reflects the five month industry slump between the announcement and delivery in quantity of the Sinclair Spectrum back in May 1982.

Those who insist on saying the micro industry is dead should remember how the industry took off again after the Spectrum arrived.

Indeed with something like ten new machines – more than ever before – announced but not yet available in the shops is it any wonder that everyone is watching and waiting?

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How to submit articles Articles which are submitted for publication should not be more than 2000 words long. The articles and any accompanying programs should be original. It is breaking the law of copyright to copy programs out of other magazines and submit them here — so please do not be tempted. **Accuracy** *Popular Computing Weekly* cannot accept any responsibility for any errors in programs we publish, although we will always try our best to make sure programs work.

Computer Trade Association Magazine of the Year

Sinclair to set up separate chip firm

SINCLAIR has announced its long-expected plans to set up its own chip manufacturing plant. A new separate company is to be formed within the Sinclair group, to continue the work on wafer-scale integration semiconductors currently being done at Sinclair's Metalab research unit.

The company will be headed by the current part time

Robb Wilmot

chairman of ICL, Robb Wilmot. New premises are to be built to manufacture the semiconductors, and Sir Clive and Wilmot aim to raise around £50m from investors to finance the venture. Wilmot recently became a non-executive director of Sinclair Research.

"The company would have the same sort of relationship with Sinclair Research as Sinclair Vehicles. The plant where the chips will be manufactured probably won't be completed until 1987," said a Sinclair spokesman.

The plant seems likely to be situated in the Cambridge area, as it will be working very closely with Metalab to begin with.

● Sinclair has also announced financial results for the nine months ending December 31, 1984.

The figures show a pre-tax profit of £7.92m on a turnover of £89.54m.

An additional £7.5m of potential profit has been written off by the company, partly through the effect of price reductions on the Spectrum+, and partly in anticipation of losses incurred by the receivership of distributors Prism Microproducts.

QL modem's future now in doubt

THE AVAILABILITY of the dedicated QL modem package, QCom, is now in doubt following the collapse of its manufacturer, OE.

Cashflow problems have forced OE to call in the receiver, although it had a virtual monopoly of the home micro modem market. OE also manufactured the award-winning VTX5000 modem and a teletext adaptor for Channel 4's *4 Computer Buffs* programme.

OE's main financial backers, bakery chain Warburton's, had previously been reported to be wary of continuing its support for OE.

Leslie Ross of accountants Thornton Baker has been appointed as receiver.

Following OE's problems, Modem House, which is now selling Prism's stocks of OE's VTX5000, 1000 and 2000 modems, has set up its own repair facility for the products.

As to the availability of QCom, a Sinclair spokesman said, "As yet, we do not know how the situation will affect the QCom package, though we obviously hope it will all work out."

Firebird links with Mastertronic

BUDGET SOFTWARE could become more easily available following the setting up by Mastertronic of its own budget software distribution company, Shuttlesoft.

So far, apart from Mastertronic itself, Shuttlesoft's only suppliers are Firebird, the software branch of British Telecom.

"We feel that most distributors don't really understand budget software," said Martin Alper, managing director of Mastertronic. "At the moment Shuttlesoft is only taking on Firebird because

Mastertronic's managing director Martin Alper

Mastertronic and Firebird look like the only reputable budget software companies likely to stay in business."

Shuttlesoft has been set up as a separate company within the Mastertronic will be continuing to use other distributors for its range of software, such as Websters, so that Shuttlesoft will be in competition for Mastertronic's and Firebirds product.

Organiser's range expands

PSION has revealed a new range of peripherals and applications software for its nine month-old Organiser pocket computer.

In addition to the 8K and 16K Eprom datapacks, a 32K datapack is to be made available. Its price is not yet fixed, but will be somewhere in the region of £40. The datapacks give the Organiser a new maximum memory capacity of 64K.

A new hardware/software interface to enable the Organiser to be linked to a full duplex modem was also announced. The hardware interface will be packaged along with the RS232 lead, already contained in the Link-up Pack for around £35. The separate software, called *Communicator* will be sold for around £30. Exact details of availability and pricing have not yet been settled.

David Potter, chairman of Psion, said, "We have now sold around 20,000 Organisers."

The company also announced details of several other new Organiser developments.

Marks and Spencer is to use a modified form of the Organiser developed by

Psion POS 100

Psion called the POS 100, to check the validity of each of M&S's new chargecards which become available in April. A list of stolen cards will be kept in a datapack on the POS 100, up-dated each day. "Now we hope to sell the system to other credit card companies and retailers," said David Potter.

Psion also hopes to attract third party software with the release of the Forth Development System at £500, enabling software to be written in Forth rather than in the in-built Organiser language Popl.

Wessex Electronic Publishing has produced custom software intended to help builders and quantity surveyors with site measurement calculations.

Medipak, for doctors, lists details of over 750 kinds of drug, and gives information on dosage, side effects contra-indications and interactions with other drugs.

Finally, the US company Superior has produced a datapack for executives designed for expenses calculation.

● The implementation of Psion's integrated *Xchange* software suite on the Apple Macintosh has been delayed until later this year. However, it may not be so long before *Xchange* appears on Rom for the Sinclair QL. "The timing of this is really in Sinclair's hands but I believe it will happen within the next six months," commented David Potter.

Oric

◄ continued from page 1

another former Oric director Peter Harding.

Whoever does buy the company, it seems likely that the Oric machines will continue to be heavily promoted overseas – sales having been consistently poor in the UK.

Amstrad launch

AMSTRAD Consumer Electronics still looks set to launch its new home micro, the CPC 664, in mid-April.

The CPC 664 will replace the 464's built-in cassette with a single disc drive. Upwards compatibility between the two is assured.

The new machine could be in the shops by late summer.

First mouse for C64

THE FIRST 'mouse' control device has been developed for Commodore 64 micro

The mouse, produced by SMC Supplies, also works with the BBC micro and comes packaged with machine code graphics software, which gives the user a wide variety of facilities. A number of different brush shapes can be used, also air brush, box and fill options, variable sized text, *Save* and *Reload* to or from tape or disc, and Centronics printer dump

It also includes a sprite and character generator which can be integrated into the user's own programs.

"The Mouse uses the joystick port and is compatible with most joystick-controlled programs on the BBC and most paddle controlled programs on the 64," said an SMC spokesman

The mouse and software together cost £59 95, and will be available in April. Versions for the Amstrad CPC 464, MSX and Sinclair QL are under development.

Details from SMC, 11, Western Parade, Great North Rd., Barnet, Herts (01-441 1282).

The micro game of Adrian Mole

ADRIAN MOLE's diaries are to be made the subject of a computer game by Level 9. The game will take the form of an adventure, but rather than typing in specific commands or directions, the player is given a menu of possible actions at each stage to choose from.

The Secret Diary of Adrian Mole Aged 13¾ and *The Growing Pains of Adrian Mole* published by Methuen have both been best-sellers, while over 100 performances of the musical based on Sue Townsend's books have been played to date at London's Wyndham's Theatre

The Adrian Mole adventure is to be published by Mosaic, in a similar arrangement with Level 9 as was reached for *The Saga of Erik the Viking*

The game is not expected to be released before this autumn, and will be launched for the Spectrum, Commodore 64, Amstrad CPC464 and BBC B. No prices have yet been fixed.

New data storage system from Icon

A NEW home micro mass storage device with a capacity of 3M and a price of around £39 is being developed by Icon Computer Products, the company which produced the Ultradrive

The product, provisionally called the Megadrive, is being developed in conjunction with mechanical engineers Sigmar Developments. "The machine uses a tape which is housed permanently inside the unit," explained David Tucker of Icon. "The 3M is divided up into 30 100K segments, so it's a bit like having 30 floppy discs."

The unit comes complete with connecting cable to the micro's user port, and Rom cartridge software

The machine loads at a rate of 2000 bytes per second. Within each 100K segment, any file can be accessed in under five seconds, although it may take two minutes to locate the relevant 100K section.

The software will be available in two versions – a 8K Rom cartridge at around £8-£9 and a 16K versico at about £20-£25

It will be launched initially for the BBC B, in around two months time. Versions are also planned for the Dragon, Commodore 64 and Amstrad CPC464

Details from Icon Computer Products on 0994 21515

Computers In Control

Letters

Two minutes

Following the correspondence on how long it takes to learn a new processor (or, I suspect, 'how long it takes to learn the 68000') may I teach the following hypothetical new processor in two minutes rather than two days!

First imagine a hypothetical new Z80 variation with a new instruction mode, a short address mode, similar to that available on the 68000, for accessing just the first 256 bytes of RAM, eg, LDS a,(£34) CALLS NZ,£42 This easily gives about 50 new instructions Next we invent a new register, called P, which holds a single byte so that we use the short instructions on any 256 byte page from the 64K, not just the first. P will either spawn only two new instructions, if it is treated like R, or dozens if treated like B to L

Now, any experienced programmer will immediately appreciate the scope and implications of these instructions in our new Z80 processor, and be able to use them to write simpler and more powerful code

Learning a new processor is just a matter of reading and appreciating the new instruc-

I would be the first to recognise that initially it was not the machine we had all hoped for.

Equally it has to be said that the machine now available is a great improvement, both in hardware and software terms. There have been improvements to the operating system, keyboard and microdrives, a drop in the price of cartridges from £5 to £2, and, just recently, machine-code implementations of *Quill*, *Archive*, *Abacus* and *Easel* bringing the whole package up to specification Package being the key word.

At first glance a direct price specification comparison the ST at a projected £399 seems a better deal than the QL. But no mass storage device/s or software are included in that price

An ST package comparable to that offered by the QL – ie, with disc drives and software would be nearer the £700 mark On that basis comparisons between the two start to look a little thin. The ST becomes more of an up-market product at an up-market price while the QL remains the lowest entry point into serious computing currently available

Also, the more complex home computers become the

Chunky graphics

Why, if the Commodore 64 has 'better' graphics than the Spectrum, are they (in all the screen shots I've seen) almost invariably horribly chunky and coarse?

Yours in puzzlement
Andrew Simmons
3 High Street
Drybrook
Glos GL17 9EA

In time to the music

By a huge fluke I found out memory location 781 on the Atmos/Oric can be tested to see if there is an input to the micro's cassette interface

I have used this to advantage by producing a routine that flashes screen colours in time with music and prints the group/musician's name in an unusual way

Just connect the tape lead as if you were going to load a program, start the tape and run the program Adjust the volume until the Oric reacts to the music If the screen flashes but no music is heard, try putting the tape lead half way into the cassette recorder or best of all use your Hi-Fi. Music that is 'jerky' or lively

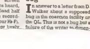
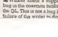
directional robots, menacing Dalek-like aliens with beeny-boppers on their heads droids which spin and move towards you, superb screen set ups – I could go on and on

Whoever thought up these things has the ability to capture the imagination of a five year old. I hope Ultimate continue to produce dazzling new games as I'm sure they will

Ian Johnson
Southview
Orchard Close
Minster
Nr Ramsgate
Thanet
Kent

Supposed bug

In answer to a letter from D. Walker about a supposed bug in the coercion facility on the QL. This is not a bug but a failure of the writer to dimen-



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Ring of confidence

***John Cook** talks to James Scoular, head of BT's software house Firebird*

Now, if I was going to start up a software house I certainly wouldn't call it Firebird

Images are evoked of a phoenix like creature destined to swan dive straight back into the flames from which it so recently re-emerged – quicker than you can say Freddie Laker

But what's in a name and, judging from the atmosphere at Firebird's London HQ (a mere Sloane's throw away from the trendy nightspot, Stringfellows) absolutely nothing at all Good natured smiles abound along with leather briefcases in an air of assured optimism that is notedly lacking in the office of most software houses But, there again, 2 3 million investors can't be wrong, can they . . . for Firebird, of course, is an offshoot of the great flagship of privatisation known as British Telecom

So, the first thing I asked the present head of Firebird, James Scoular, what was the reasoning behind BT's entry into the tumultuous software market? In fact, it seems that the turmoil within the industry itself was something of a deciding factor "We spotted a hole in the market," he told me "In an industry of promises we provide guarantees . . . if authors send programs in to us, they know we are going to be around still paying them royalties in a year's time "

This theme of "stability and assurance' extends to the other end of the market, the consumer He continued "On our Silver Range games, we provide actual screen shots of the games on the cassette box People can see what they are getting before they buy And we charge £2 50 for the Silver Games . . . not £2 49 Above all we want to be open and honest with the customer " With the sales of *Booty* reputedly hitting the six figure mark, it's a policy that seems to work well.

But I still found it difficult to make the link between BT and computing Things start falling into place when you realise that the Data Processing Executive of BT, with a 4000 plus staff attending 36 large mainframes at 13 centres around the country, makes BT one of the biggest computer users in Europe Surprisingly, however, despite this wealth of talent to draw on, Firebird operates strictly as a publishing house, with no 'in-house' programming team. . James Scoular again had the answer

"Any in-house programming team, no matter how good, will eventually dry up creatively, and they tend not to be as flexible as outside authors "

In fact although James didn't join the Firebird team until September '84 (from a previous background in magazine publishing, including such titles as *What Micro* and *Personal Computer Games*) the whole operation started in the middle of last year with adverts going in the computer press asking for original programs

Responsible for wading through the sackfulls of replies was Operations Manager Tony Rainbird, himself an ex-Warehouse Manager and 'backroom' publisher of his own Micro-Gold label. Out of 2000-odd submissions, he accepted about 20!

"Everything that comes in needs improving in some way," he explained. "Either music, loading screens, graphics or joystick options. If we are interested, we'll send it back to the author explaining what we want done "

But what does he look for in a program that makes him want to accept it?

"If it's for the Silver Range, then 70% of it is in the playability For the Gold Editions, then we look for something extra . . . originality. . some kind of technical innovation."

At present, the Silver Range, selling at £2 50, comprises of some 24 titles covering all the popular home micros The Gold Editions are individual titles reckoned by Firebird to be something a bit special.

"We often receive Gold games as half completed ideas,' says Tony "If it look's worth it, we can then help the author turn it into the finished product with extra equipment or advances "

Such was the case with Firebird's imminent Gold release, *Gyron* Written by a team of four computer scientists/mathematicians based in Edinburgh, it features the best 3-D graphics I've ever seen on the Spectrum but be warned . . . it isn't exactly the easiest game I've ever played! Prepare yourself for considerable brain strain.

The acquisition of the rights to *Elite* – the Commodore version due for late April release (£14 95), the Spectrum and Amstrad versions (converted by the *Gyron* team) due about June – certainly suggest that Firebird means to become a leading force in the software market – and has the money to do it Wasn't the reason why Firebird can afford to stand back from the hurly-burly of the software market simply that it has the backing of a multi-billion pound corporation behind it?

James waved a file at me marked 'Budget'. "I'm under just the same commercial pressures that face any company," he told me. It was a very big file indeed.

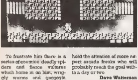
However, it has to be said, commercial pressures or not, that Firebird have followed in the steps of Mastertronic, polished up the act, and put budget software well and truly on the map with the Silver Range, and are producing some good, sometimes excellent, games at reasonable prices with the Gold Editions, albeit a little complacently With some interesting developments on the horizon in the 'entertainment software' field, and further ahead the possibility of downloading of games via 'phone or cable link, things are looking pretty good at Firebird.

As James said as a parting shot, "I know this is going to sound terribly, terribly kitsch, but we do like to think we do things properly." It does, and they do

Totem figure

Program *Banjax* **Price** £9.95 **Micro** BBC B **Supplier** Robico Software, 3 Fairland Close, Llantrisant, Mid Glamorgan CF7 8QH

First came Jonathan Livingstone Seagull – now Banjax Bear, another animal intent on reaching the higher things in life. Banjax, a rather cute teddy, has to explore a series of mazes, trying as he goes to accumulate treasure. If he does well enough he may enter the mystical Golden Temple.



To frustrate him there is a series of enemies: deadly spiders and fierce vultures which home in on him, wriggly worms and gargoyle heads which stick to their own paths but are deadly if struck, Totem figures which don't hurt him but block the way. Banjax is controlled from the keyboard and when he does get bumped off he'll revive at the point where you last pressed *return*. You have four lives each turn.

The mazes are well presented with a variety of colour and design. Crossing from one screen to another generates random enemies so one way to progress is to dart to-and-fro until the screen ahead is clear of the most dangerous ones. It will appeal most to younger games players. You can make good headway within a few tries but the game will not hold the attention of more expert arcade freaks who will probably reach the goal within a day or two.

Dave Watterson

Keyboard

Program *Typing Tutor* **Price** £9.95 **Micro** BBC B **Supplier** Willow Software, The Willows, Wrington Lane, Congresbury, Bristol BS19 5BQ

Typewriter style keyboards always seem totally illogical. However, since the BBC micro is an ideal word-processor, it makes sense to use its standard QWERTY keyboard to learn to type properly. *Typing Tutor* uses a well-tried system where you learn to rest your fingers over specific 'home' keys and move from there.

The program offers a choice of exercises – ranging from simple practice at typing specific letters up to writing whole sentences. The screen shows the letters or words to be typed and a picture of the keyboard. At the end of each exercise, you are told how many mistakes you made and your speed.

I have only one reservation. The keyboard display shows each letter which is to be typed highlighted in red. I found myself following the highlighting rather than thinking about the actual position of each letter. In the more advanced exercises whole sentences were presented on the screen in phrases but the program would not allow a space to be typed at the end of each phrase.

On the whole, though, this is a very good teaching program with a helpful booklet and sensibly paced lessons.

Jan Watterson

Professional

Program *FirstWORD* **Price** £35.99 **Micro** Commodore 64/Disc Drive **Supplier** First Publishing Ltd, Unit 20B, Horseshoe Road, Horseshoe Park, Pangbourne, Berks

FirstWORD is one product of the IT revolution that will be equally welcome in both the home and the electronic office. This program provides a truly professional word processor for creating, storing and editing documents.

Now, word processors are usually judged on their efficiency in three main areas of operation: a) Inputting text b) Outputting text and c) Editing text. In *FirstWORD*, text can be entered in a continuous string on lines of 40 or 80 characters. No need to worry about words "spilling over" – this is taken care of by the formatting commands. Although a choice of three character sets is available (one of which is "user-defined") it is as well to remember that these sets only appear on the screen.

When it comes to printing, you can either use a Commodore printer connected to the serial port, or a Centronics parallel printer interfaced to the Commodore 64's user port. Text can be printed at 10, 12, or 15 characters per inch, and there is a choice of three different line spacings. Printing can be "right-justified", underlined, emboldened, or superscripted.

It is in the Edit mode where this program really comes into its own. *FirstWORD* has a full screen editor which enables you to move blocks of text as well as inserting and deleting words.

For invoicing and accounting a calculator facility is available, and special control characters enable changes to be made to the printed copy of a document. (d, for example, directs the computer to print the current date at that point in the document).

FirstWORD is comparatively easy to use, with many of its commands being displayed clearly, using a menu/submenu system. Anyone with a serious interest in word processing could do a lot worse than invest in this program.

Tom Hussey

Well-starred

Program *Astrology Starter Pack* **Price** £11.50 **Micro** Spectrum 48k (Many others available) **Supplier** Astrocalc, 67 Peascroft Road, Hemel Hempstead, Herts. HP3 8ER

Anybody who has ever constructed an astrological birth chart will know how time consuming the calculations are, and those who haven't may well have been put off by the daunting tables of figures.

Computers are ideal number crunchers, and several hours work can become several minutes on the micro, which is what the first program on this introductory cassette does. Enter date, time and place of birth and soon the planetary positions, by sign and house, are displayed along with the major aspects.

The other two programs teach the planets' and signs' meanings by rote and include test options which have a tendency to repeat questions. A small but clear booklet completes the package.

That the intention of this software is serious is beyond doubt, it bears no relation to daily paper 'horoscropes'. It serves as a taster for newcomers to the art. Should you become seriously interested, more accurate chart drawing programs and aids to interpretation are available, but at prices that could make this a very costly hobby.

This program serves its purpose well enough, but I can't help feeling that it should offer more for the money.

John Minson

Crashproof

Program *Titan* **Price** £7 95 **Micro** Spectrum 48K **Supplier** Tomorrow's Dream Software, Richmond House, 18 Sydenham Road, Cotham, Bristol BS6 5SH.

If the thought of writing machine code terrifies you, read on. If not, you either possess a debugging monitor already or you're too ignorant of the hazards of addressing a CPU to need one

A machine code monitor can be located anywhere in memory and it allows you to run through any section of Ram or Rom, indicating what lies where, and more importantly how it behaves when it is run and what the state of the various registers and flags is

Titan, which is about 5 5K long, allows all this and more. Programs or subroutines can be single stepped at normal or slow speeds and listings obtained in Hex, Assembler or ASCII You can also switch off its display, a reasonably clear 'front panel', to run graphics sequences uninterrupted. Hex/decimal conversions are catered for, as is has arithmetic. There are two types of breakpoint, moving and comparing blocks of memory, locating a string of code and memory alteration options

This makes for many single key commands and the manual could be clearer, though a useful card lists them all *Titan* can't make code easy, but it can certainly help

John Minson

A little learning

Program *Tops and Tails* **Price** £5 95 **Micro** Spectrum 48K **Supplier** Macmillan Software, Macmillan Publishers Limited, 4 Little Essex Street, London WC2R 3LF

Devising games to entertain 4-8 year olds while fostering their reading skills is the challenge Betty Root, a child education expert, has taken on with these two programs They deal with the first and last two letters of words

Snakes is Snakes and Ladders and needs an opponent. Certain squares on the five by five board contain pictures, typing their initial letters moves you on an extra piece

Tailend can be played against an opponent or solo The child enters the last two letters of pictures that slide across the screen, before they reach the edge There are nine speed levels and the reward is a picture of a cat or dog wagging its tail.

The games are certainly visually attractive, and despite their smallish size the illustrations are almost all easily recognisable

I have reservations about the programs' lasting appeal though. *Tailend* is rather thin as a game and needs fastish keyboard recognition, while the *Snakes'* board is too small Still, if you must educate your child by computer you could do worse

John Minson

Happy torc

Program *Dragontorc of Avalon* **Price** £7 95 **Micro** Spectrum 48k **Supplier** Hewson Consultants, 56B Milton Trading Estate, Milton, Abingdon, Oxon OX14 4RX

Avalon had numerous fans
Who fought with Maroc in this land
And now their mage the realm must walk
To seek the deadly Dragontorc
For Morag, foul and evil Queen,
Has made a threat both vile and mean
To use the Torc's horrible power
To crush the bud of Celtic flower
Now those who once helped wise Maroc
Will rejoice that the hero's back
For never was a phrase used truer
Than calling this 'arcade adventure',
All control being by joystick.
There's much to use, especially magick,
Ley-lines to travel, levels to map –
Plan wisely to avoid mishap
Characters behave with such a feel
You'll soon believe Avalon is real,
For as you play this game you'll find
That other races act in kind
Some may fight, some may trade –
Only with help will Morag be slayed.
From forests to dungeons the scenes are beauts,
Despite some problems with attributes
This game is truly a masterpiece,
A visual and a mental feast,
Load it up, you'll want to play
So join the chorus of my lay
(One, two, three, four...)
Happy, torcing, torcing *Dragontorc*
Torc about games you like to play...

John (Chaucer) Minson

In disguise

Program *Spectrum Simulator* **Price** £14 95 **Micro** Commodore 64 **Supplier** Whitby Computers Ltd 7 Chubb Hill Road, Whitby, N Yorks

You may have flown planes on your Commodore 64 You may have driven cars. You may have even played football Many things have been successfully simulated over the past few years But now comes something completely different, now you can simulate a Sinclair Spectrum!

The *Spectrum Simulator* is an odd program, it's not a game, yet it's interesting It's not an ordinary utility yet it is useful. Perhaps it's an operating system but if so it's an odd one It certainly doesn't make the best use of the C64 hardware, nor does it offer an extension to the existing system software by adding commands in the way that Basic enhancers do What it does do is let you run Spectrum Basic on the C64, complete with single-key entry of commands and functions

The simulation is so good that you can load Spectrum programs from cassette and, as long as there is no machine-code, run most of them with no modification Spectrum Basic on the C64 is a little unnerving to say the least It takes even longer to find the right key for a particular command, despite a *Help* facility on the Commodore version

There are several reasons for believing that the people at Whitby Computing have not entirely lost their marbles Spectrum Basic is much more useful as a computing language than that apology for Basic that comes with the C64 and, although not making the most the of the machine, the *Spectrum Simulator* does at least let you use graphics and sound from Basic.

John Cochrane

Cockney sextet

Program *Everyone's A Wally* **Price** £9.95 **Micro** Spectrum 48K **Supplier** Mikro-Gen, 44 the Broadway, Bracknell, Berks

Nightmare! A sextet of Wallies! Crested, mohican Wallies! Wallies in woolly hats! Well-out-of-it, stoned-hippy Wallies! HELP!!!

In this, Mikro-Gen's third *Wally Week* game, they seem so real they even walk in character. The detail of these animated caricatures makes me wonder . . .

This day in the life is too full to be a mere game. At least you can command members of the odd-job gang and try to set the town to rights (and earn some readies into the bargain), but while you're in charge of one character the others have lives of their own.

Everybody has their own specific tasks, which in the case of Wilma, Wally's wife, is to do the shopping – an unwelcome sexist stereotype, but what else can you expect of Wallies?

Despite attribute problems the town looks beautiful, and in fact, the search for tools of the trade could make this voyage of discovery a way of life for some, what with its accompanying, horribly catchy piece of Cockney pop.

Which is where my fears start. I mean, I'm not paranoid, but this could be a conspiracy by the Wallies to take over!

John Minson

De-bugged

Firmware *Slave* **Price** £49.95 **Micro** BBC B **Supplier** A&F Software, Unit 8, Canalside Industrial Estate, Woodbine Street East, Rochdale Lancs

Bad Program is one of the most frustrating messages to come up on BBC micro screens. There are various routines you can type in to try to rescue your corrupted masterpiece of coding . . but you never have the listings handy. Imagine just typing **Bad* and being able to *List* your program virtually complete. That's just one of the facilities at your service in *Slave*.

Slave, a 16K Eprom, allows you to list a basic program forwards *and* backwards. You can edit lines as if they were on a word-processor with insertion and deletion made easy. You can instantly replace all the variable names – from long descriptive ones to brief faster-running ones, for example. It lets you run your program with a *Trace* facility printing the line numbers clearly in the top left corner and not corrupting the display. It also features a debugging tool that will find every variable name and list the lines it appears in.

These are only a taste of the extremely powerful and exciting possibilities in *Slave*. The well written booklet accompanying the chip is a model of clarity and includes demonstration sequences. Two more facilities we must remark upon: a CLC (Cyclic Redundancy Check) system which allows you among other things to verify your recording of a program or file against the version in memory, and a comprehensive *Help* screen.

These days a chip really has to earn its place in a BBC Rom socket. There is so much available in Rom format that only the best and most useful are allowed to stay.

At nearly £50 *Slave* is pricey but much more powerful and user-friendly than most of its rivals.

Dave & Jen Watterson

Assembled

Program *Unique Assembler Package* **Price** £18.95 **Micro** QL **Supplier** D. A. Bandoo, 81 Mount Pleasant, Wembley, Middx HA0 1UD

There are a large number of assembler packages around for the QL, most of which cost between £30 and £40. So it is a nice change to see a low cost package which will not break the bank and still allow you to write powerful machine code programs with ease – the *Unique Assembler Package*.

The software comes in three main parts, the editor, the assembler and a disassembler. There is also a clone program and four text files which give two m/c subroutines, an example and a multi-tasking clock. The editor is a line editor so each line is given a number, like Basic, edited by moving the cursor around the screen and you get to the line you want.

Unlike most of the assemblers available this one is part of the editor so you don't need to load it before you can use it. Such a system means that you don't have to save the source file and then reload it for the assembler, saving both time and memory. The last program supplied is a simple disassembler which allows you to look at already assembled code.

At this price – definitely recommended.

Roger Thomas

Carry that Lode

Program *Lode Runner* **Price** £11.95 **Micro** Commodore 64 **Supplier** Ariolsoft

Everyone agrees that computer games have improved enormously over the last couple of years. It is amazing, therefore, that *Lode Runner*, released two years ago in America by Broderbund, should still have what it takes to be a top game.

Like Broderbund's other games, it cover the antics of the Bungeling Empire. Power-hungry leaders of this repressive empire have stolen a fortune in gold from the peace-loving people, and guess what? You've just discovered their secret underground treasury. Your goal? To recover every last ingot of Bungeling booty.

On each of the 150 platform-like levels you have to collect all the gold chests, after which an exit will appear. Unlike other platform games, you cannot jump, but your laser drill can be used for drilling passageways and for drilling pits to catch the Bungeling guards.

A player loses one of his five lives if he gets trapped in a pit or caught by a guard. Various interesting features are also included in the game, eg, commands for speeding up or slowing down the play. *Lode Runner* is very user-friendly – you can even use cheat-keys for adding lives or advancing to the next level.

The disc also contains a powerful game generator program. With this, you can design, play and save your own screens.

Great fun! *Lode Runner* is a very well-thought-out package and is extremely playable. A must for game connoisseurs.

Tom Hussey


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Pocket Micro Survey

Pockets bulging, Jeremy Vine has a look at the latest mini micros

Those clever people from the Far East have always had my admiration. Firstly, calculators that made my ten fingers redundant, then the bleeping digital watch and now the pocket computer. These machines have in fact been around for almost six years but only now are they truly coming of age. With improved LCD technology, the slow drop in the price of Cmos Ram and the ingenuity that we have now come to expect, the logical progression in micros is the advent of a pocket computer. But the Japanese are not alone in this field and Britain has made its own step into this growing marketplace.

Machines that can fit in your pocket are an attractive proposition, but are these micros powerful computing tools or merely another clever gimmick that looks good? I gathered eight of the latest goodies from both British and Japanese manufacturers to see whether they lived up to their respective claims.

The market in pocket computers is dominated by Casio and Sharp and all the Casio/Sharp models reviewed here use Basic as their language. The keyboards follow the Qwerty layout convention, though the size of the unit and therefore the keys makes life a little difficult. Display space is at a premium on these machines and there is a gradual move towards larger LCD screens, getting away from the restrictions of the calculator, from which the pocket micro has developed. The calculator 'roots' of these machines are much in evidence, both in their physical appearance and the calculation functions which means the machine can double up as a calculator.

The pocket micros are rapidly becoming packed with more and more features and the following review indicates the direction that manufacturers are taking.

Casio PB-700/Sharp PC-1350

These two are the most expensive of those currently available and offer the largest LCD, both being 4 lines with 20 and 24 characters on the PB-700 and PC-1350 respectively. Both machines can also handle graphic commands with the Sharp having a 150 × 32 dot display and Casio marginally higher at 160 × 32. The Sharp machine is the more compact of the two, but of course the trade-off in size causes the keyboard to be noticeably smaller. Having said that, I found both keyboards manageable and within a short time one becomes adept at using these minuscule keys.

The PC-1350 comes with a slide-on hard plastic case, as do all the Sharp machines reviewed here which I felt offered better protection than the soft case that is supplied with the Casios.

Both machines have their own unique edge connectors for interfacing to cassettes and printers, more of which later. The PC-1350 does offer an extra serial I/O port which is one of the most interesting developments on pocket micros. This makes their usage of the micro wide-open with possibilities of transferring data between machines. Obvious applications would involve collecting data on the pocket computer and transferring to a micro at the end of the day. The I/O port can communicate at up to 1200 baud, asynchronous, half-duplex. It's very encouraging to see Sharp taking this step and perhaps with bigger and better displays eventually appearing, communications will become an integral part of the pocket computer.

Entering a Basic program is relatively straightforward, though my preference in this category was for the Casio. On all Casio machines, many of the Basic keywords can be obtained by pressing a single key in conjunction with *Shift*. No such facility was available on the PC-1350 and this made programming slightly slower. Single key entry is a useful feature on these computers because of the small keys.

Sharp and Casio have also followed different avenues of thought when it comes to program storage. All the Casio machines have 10 program areas, therefore allowing up to 10 separate programs to be stored, memory permitting. The relevant program area is easily entered by pressing *Shift* and the number of the area, and where a program is present it will be automatically run. As would seem likely with the kind of appli

Pocket Micro Survey



cations that these handhelds are used for, the provision of 10 program areas should suit most people's needs. This could be expanded upon by careful numbering within programs and combining several programs in one area.

Sharp, on the other hand, have set no such limitations, but instead allow the user to define procedures by applying a label to a program and calling it up by its label (only one letter allowed). There is a ceiling of 18 labels allowed, creating in theory a maximum of 18 programs. However, my above remarks for the Casio apply here as well. This, as far as the user is concerned, means there is only one program area and careful numbering must be applied to the programs. Having used the Casio first I found this latter method messier. The documentation with the PC-1350 passes over the labelling of programs in a few lines and is easily missed.

The Sharp machines also employ two main modes of operation, Program mode for writing programs and the Run mode. I couldn't quite see the reason for having to switch modes the whole time and found it an annoying feature. However, the Sharp does offer the possibility of user-definable keys and the keyword entry problem mentioned above could be negated by employing the Reserve mode of Sharp. This allows functions to be assigned to a key and a template is supplied with the machine for users to add their own key definitions.

Memory has in the past been one of the major problems with pocket computers – the problem being the lack of it! However, both Casio and Sharp are building their machines with more built-in memory and with options to add extra byte-power. The PB-700 come as standard with 4K Ram expandable to 16K by the addition of up to three 4K datapaks (OR-4). There is a Ram-backup battery present in the machine for when the main set of batteries is changed.

The 1350 has 5K Ram and can be expanded to 13 or 21K using either an 8K or 16K Ram card but these are not cheap. The Sharp Ram card has its own battery as does the Casio Ram card available for the FX750P (see below).

The documentation supplied with both machines is adequate, but by no means mind-blowing. As reference guides they do a good job but don't expect to master Basic from these guides. However, I suspect that many of the people who would be attracted to these machines may well have a rudimentary knowledge of Basic already.

There is very little to choose between these two machines at the end of the day and it's to the credit of both companies that the product is good. Where the PB-700 crept ahead for me was in the availability of a four-colour plotter supplied with the review machine. The FA-10 is a delightful 4½ inch, paper wide plotter-printer which turns the machine into a very useful lab/college tool. The quality of the print was very acceptable and makes the PB-700 into a complete system. However, Sharp have a four-colour plotter which is cheaper, so the battle goes on. All in all, it's a hard decision and it'll probably be some minor point that will make the buyer go for one or the other.

Casio FX-820P/Casio FX-750P

Two other interesting pocket micros in the Casio family are the FX-820P and FX-750P. Both these machines have more functions squeezed on to the keyboard and utilize the Ram card system. The 750 has two slots for Ram cards (therefore up to 8K) and thus offers a disc-like capability of storing data and programs on different drives. The first is a built-in Memo pad program which can be used for storing telephone numbers or any such databank function.

The second feature is the presence of a thermal printer. This draws heavily on the power and explains the inclusion of NiCad rechargeable batteries. The keyboards on both machines are well laid-out but because of this space, the LCD is only one line and the 820 display in particular is very small, but of course the display can scroll across.

Sharp PC1-1246/ Sharp PC-1260

The 1260 had 4.4K Ram and a two-line display. Along with the 1246 it's the smallest of all the models reviewed and despite its small memory has one or two interesting features. Taking up part of the 40K Rom is a *Help* facility. When called the *Help* key gives brief information of the Basic commands. This may be of help to beginners, but after a short time the need for the *Help* key will be negated by an ever-increasing knowledge of the machine. The idea of using the extra space in Rom is good but I feel it could have been better utilised. A built-in database or some such other utility would have been far better.

The 1260 does, though, boast a useful



Pocket Micro Survey



alphabetic keyboard (not Qwerty) and a one line LCD. I have to say straight out that I feel it cannot in any way be compared to the previous machines. To call it a 'practical pocket computer' as the advertising suggests is an exaggeration. The Organiser has the potential as a pocket computer but at present lacks a reasonable programming language and as such is not a programmable machine and therefore destroys its claim as a pocket micro. As an electronic database it is passable, but its ultimate success will lie in the software support.

Where the Organiser does have distinct advantages over its rivals is in large memory capacity at a fraction of the price. But this has its own inherent problems as the Organiser uses Eproms and there is no way of re-organising data held on the Eprom. Eventually the user will run out of space and have to reformat the chip, therefore erasing all data. This is very annoying, but in fairness to Psion it takes quite a while to fill up even 8K let alone 16K.

The most useful add-on for the Organiser is the Link-Up package which enables the Organiser to communicate

facility, in that preset equations can be entered and recalled at a later point. Sharp calls this the Easy Simulation Program and needs no use of Basic, but allows the user to set up prompts to the information to be entered by the user. I found this the most useful of the built-in facilities and provides a quick and easy method of programming.

Finally the 1246. This is at the bottom end of the price range and is a one line 2K computer. The memory restriction is quite severe on this model but is a relatively cheap offering that will attract the school/college buyer. It is also the only one of the Sharps to have keyword entry as mentioned earlier.

Both the Casio and Sharp machines have, as already indicated, a range of peripheral devices for printing and cassette storage. With the addition of these peripherals the pocket micro can become an interesting prospect. The major criticisms of these machines is the cost of extra memory which is still quite steep and the screen displays. These points aside, the pocket computer is far from a gimmick and as a professional tool for working out complex equations or handling small amounts of data it is ideal. As a handheld database for business there is software support from independent companies in the form of databases/mini-spreadsheet facilities. Even a text processor for the PB 700!

Psion Organiser

The pocket computer is not merely the domain of the Japanese, and one British company trying to break that domination is Psion, with its pocket micro the Organiser. Housed in a sturdy plastic case, this calculator look-alike has an



Pocket Micro Survey

via an RS232 interface. I hooked my Organiser to a BBC and had data transferring in both directions quite happily. The Link Up package can communicate up to 19600 baud, though I found with the BBC that above 300 baud I was receiving corrupt characters.

The Organiser is at present not quite a pocket computer. It's obvious that the hardware is capable of being very good but for a long time software has let it down. And POP, the Organiser's in-built language, is extremely limiting. The Organiser also has a built-in clock but is not used in any constructive way unlike the Biztec Pad, reviewed below. At the moment I can only consider it as a database. Its strongest feature is the RS232 link and I look forward to further developments on that front.

Biztek Pad

Finally a machine that does not claim to be a pocket computer, but an electronic diary/database/calculator. Armed at business users, the Biztek Pad is the electronic equivalant of a business diary. It has a very large display and a keyboard in alphabetic order. The screen shows 16 characters and can scroll for up to the entire memory capacity (some 4000 characters). Like the Organiser it has a built in clock plus a calendar. This is used to good effect by allowing the user to enter appointments with date and time, and an alarm will remind you of your appointment.

Data can be searched for by entering one or more characters to be matched – although this is not quite as good as the search facility on the Organiser it is faster. For business, expenses can be entered under different headings and later enabling separate or total bills to be worked out.

I was very pleased with the Biztek Pad and enjoyed using it. I still think a pen and paper is faster but it's still useful. I would have liked to have seen a larger memory capacity but that aside it's a good product.

Casio Pocket Micros:
FX750P £89 95
FX820P £99 95
FB700 £129 00
Ram Cards
2K (RC2) £19 95 4K (RC4) £39 95
(OR4 4K module for FB700) £27.95
Peripherals
FA10 (4 Colour Plotter/Printer/Cassette Interface) £182 95
CM1 (Microcassette Deck for FA10) £89 95
FA20 (Printer + Cassette Interface) £89 95
Casio Electronics Co Ltd, Unit 6 1000 North Circular Road London NW2 7JD Tel. 460 9131

Sharp Pocket Micros:
PC1248 £36.95
PC1260 £99 95
PC1350 £129,00
Ram Cards
CE201M (8K for PC1350) £69.95
CE202M (16K for PC1350) £114 95
Peripherals
CE125 (Printer/Cassette Recorder) £99 95
CE126P (Printer/Cassette Interface) £59 95
Sharp Electronics (UK) Ltd, Sharp House, Thorp Road, Newton Heath, Manchester M10 9BE Tel. 061 205 2333

Psion Organiser incl. 8K Datapak £99 95
8K Datapak £12 95 16K £19 95
Science, Maths and Finance Pack £29 95 each
Link-Up Communication Pack £39 95
Psion. 22 Dorset Square, London NW1 6QC



The Great Wall

Multi-level arcade action on the BBC B brought to you by *Timothy Dhillon*

The *Great Wall* is similar to the popular arcade game *Hunchback*. You are anxious to move along the top of the Great Wall and so reach home On reaching home you pull the lever and reach . safety? Well, eventually you reach safety! Unfortunately, before that happens the lever releases a number of obstacles that must be jumped

The obstacles change at each of nine levels and you must also avoid the poisonous stalactites If you lose a life you start again at the left of the screen You have five lives and can gain extra every two levels Your score progresses as you jump or clear a level

As if that isn't enough there is a time limit for moving along the top of the wall shown as a bar at the bottom of the screen

Pressing *Shift* on its own will make your character jump straight up, but by pressing *Z* or *X* (left and right) you may jump in that direction.

Program Notes

Part 1

Defines and displays the characters (224-255), gives instructions and then loads *Part 2*.

Part 2

10-50		Rem statements
70-140	–	Setting up variables
190-230	–	Setting up variables
240-420	–	Setting up screen
430-730	–	Main program,
740-1560	–	Defines procedures

Type in *Part 2* and save as GAME 2'.

```
10REM ******************
20REM * The GREAT WALL *
30REM *  By T.Whillen  *
40REM *    For the     *
50REM *   ABC MICRO    *
60REM *  MICRO USER.   *
70REM ******************
80MODE1
90VDU23;8202;0;0;0;
100COLOUR129:CLS
110VDU19,0,5;0;
120VDU19,1,4;0;
130VDU19,2,12;0;
140VDU23,224,255,129,165,189,189,165,129,255
150VDU23,225,255,0,239,43,43,232,0,189
160VDU23,226,255,1,229,93,81,93,1,255
170VDU23,227,189,153,195,36,24,24,24,24
180VDU23,228,112,248,248,240,124,14,7,3
190VDU23,229,3,7,14,124,240,248,248,112
200VDU23,230,60,18,10,16,9,16,16,22
210VDU23,231,60,72,80,80,144,8,8,104
220VDU23,232,41,43,47,64,143,130,130,64
230VDU23,233,148,212,244,2,242,98,66,4
240VDU23,234,23,100,252,252,0,0,0,0
250VDU23,235,232,36,63,63,0,0,0,0
260VDU23,236,0,115,74,75,75,74,115,0
270VDU23,237,0,208,16,144,144,16,222,0
280VDU23,238,0,123,74,123,83,74,75,0
290VDU23,239,0,222,16,144,150,18,222,2
300VDU23,240,3,57,124,218,223,238,124,59
310VDU23,241,192,156,62,119,251,119,62,156
320VDU23,242,255,170,255,170,255,170,255,170
330VDU23,253,255,255,126,126,60,60,24,24,0
340VDU23,254,0,223,223,223,0,255,255,255
350VDU23,255,0,255,255,255,0,251,251,251
360VDU23,243,255,195,230,189,152,188,231,255
370VDU23,244,255,195,103,61,25,60,103,255
380VDU23,245,192,143,51,70,135,49,28,3
390VDU23,246,3,241,140,66,65,134,56,192
400VDU23,247,0,56,62,126,254,136,152,240
410VDU23,248,0,120,124,126,127,57,41,35
420VDU23,249,0,254,130,238,40,40,40,57
430VDU23,250,0,124,66,89,85,89,66,124
440VDU23,251,0,6,30,127,255,127,30,6
450VDU23,252,0,254,0,255,255,255,0,298
460PRINTTAB(10,2);"The Great Wall" .."
470PRINTTAB(2,3);"S-Sound On";TAB(28,3);"Q-Sound
Off"
480GCOL0,0
490MOVE 250,675:MOVE 250,675
500PLOT85,975,675:PLOT85,975,775:PLOT85,250,775:
PLOT85,250,675
510PRINTTAB(8,8);CHR$230;CHR$231;:PRINTTAB(8,9);
CHR$232;CHR$233;:PRINTTAB(8,10);CHR$234;CHR$235;
520MOVE250,250:MOVE 250,250
530GCOL0,0
540PLOT85,975,250
550PLOT85,975,550:PLOT85,250,550
560PLOT85,250,250
570PRINTTAB(11,9);"- This is 'YOU'"
580PRINTTAB(8,15);CHR$236;CHR$237;" - The first
 stage";
590PRINTTAB(8,17);CHR$238;CHR$239;" - The Secon
d stage";
600PRINTTAB(8,19);CHR$240;CHR$241;" - The Third
 stage";
610PRINTTAB(8,21);CHR$242;CHR$242;" - The Fourt
h stage"
620PRINTTAB(8,23);"Try and find the rest"
630GCOL0,2
640MOVE 250,775:DRAW 335,925
650MOVE 975,775:DRAW 905,925
660PRINTTAB(9,12);"Z - LEFT   X - RIGHT"
670PRINTTAB(13,13);"SHIFT - JUMP"
680PRINTTAB(5,12);CHR$228
690PRINTTAB(1,13);"Lever";TAB(2,14);"Up"
700PRINTTAB(35,12);CHR$229
710PRINTTAB(33,13);"Lever";TAB(33,14);"Down"
720PRINTTAB(2,20);"Copy";:PRINTTAB(1,22);"FREEZE
"
730PRINTTAB(32,20);"Delete";:PRINTTAB(31,22);"UN
FREEZE"
740PRINTTAB(17,4);CHR$224;CHR$225;CHR$226;
750PRINTTAB(18,5);CHR$227;
760PRINTTAB(4,25);"Press 'Space' to load next pa
rt"
770REPEATUNTILGET=32
780VDU28,12,30,26,27
790PRINTSPC(255)
800CLOSE0
810CHAIN"GAME2"
820END

10REM ******************
20REM * THE GREAT WALL *
30REM *     Part 2     *
40REM * By T.Whillen   *
50REM ******************
60MODE1
70A$=" ":B$=" "
80Z%=15
90CLS
100H%=104
110K=0
120SC%=0:HI%=500:Z$="T.Whillen"
130VDU4
140AG=0
150VDU19,1,5;0;
160VDU19,2,13;0;
170VDU19,3,12;0;
180VDU23;8202;0;0;0;
190LI%=5
200L%=1
210X=3:Y=10
220A=34:B=12
230C=18
240FORI=0TO1279STEP4
250GCOL0,1
260MOVE I,800:DRAW I,1024
270NEXTI
280FORI=400 TO 900 STEP4
290GCOL0,1
300MOVE I,300:DRAW I,330
310NEXTI
320GCOL0,7
330MOVE 400,300:DRAW 900,300:DRAW 900,330:DRAW 4
00,330:DRAW 400,300
340COLOUR3:PRINTTAB(5,28);"LIVES:-";LI%;"  LEVEL
:-";L%;"   SCORE:-";SC%
350PRINTTAB(13,3);"Hi-Score - ";HI%;"   ";TAB(13
,4);"Done by ";Z$
360PRINTTAB(17,23);"TIME"
370FORP=3 TO 36 STEP 2
380FORI=14 TO 20
390COLOUR1
400PRINTTAB(P,I);CHR$255
410PRINTTAB(P+1,I);CHR$254
420NEXTI:NEXTP
430COLOUR2
440PRINTTAB(20,8);CHR$253;CHR$253
450PRINTTAB(10,8);CHR$253;CHR$253:PRINTTAB(20,8)
;CHR$253;CHR$253
460PRINTTAB(A,20);A$;B$;"  ";
470PRINTTAB(0,10);"    ";
480COLOUR1
490PRINTTAB(35,9);CHR$224;CHR$225;CHR$226;
500PRINTTAB(36,10);CHR$227;
510COLOUR3:PRINTTAB(34,9);CHR$228;:COLOUR2
520PRINTTAB(12,28);LI%:PRINTTAB(22,28);L%:PRINTT
AB(34,28);SC%;"  ";
530PROCP(X,Y)
540PROCTIME
550PROCD(A,B)
560A=A-1
570C=C-1
580IF INKEY(-98) THEN X=X-1
590IF X<=3 THEN X=3
600IF A=X OR A=X+1 OR A=X+2 THEN PROCCRASH
610IF C=X OR C=X+1 OR C=X+2 THEN PROCCRASH
620IF A<=3 THEN A=36
630IF C<=3 THEN C=36
640IF INKEY(-82) THEN S=0
650IF INKEY(-17) THEN S=1
660IF INKEY(-67) THEN X=X+1
670IF X>=32 THEN X=32
680IF X>=32 AND INKEY(-1) THEN PROCNEXT
690IF INKEY(-1) THEN PROCJUMP
700IF INKEY(-106) THEN PROCFREEZE
710PROCT(K)
720GOTO430
730END
740DEFPROCP(X,Y)
750COLOUR1
760PRINTTAB(X,Y);" ";CHR$230;CHR$231;" ";
770PRINTTAB(X,Y+1);" ";CHR$232;CHR$233;" ";
780PRINTTAB(X,Y+2);" ";CHR$234;CHR$235;" ";
790ENDPROC
800DEFPROCJUMP:COLOUR1
810PROCP(X,Y-1):PRINTTAB(X,Y+3);"    "
820A=A-1
830C=C-1
840PROCD(A,B)
850PROCT(K)
860PROCSO:SOUND2,-Z,40,1
870IF X=8 OR X=9 OR X=10 OR X=18 OR X=19 OR X=20
OR X=27 OR X=28 OR X=29 THEN PROCCRASH
880PROCP(X,Y-2):PRINTTAB(X,Y+2);"    "
890A=A-1:C=C-1:PROCD(A,B)
900PROCT(K)
910PROCSO:SOUND1,-Z,50,1
920PROCP(X,Y-3):PRINTTAB(X,Y+1);"    "
930A=A-1
940C=C-1
950PROCD(A,B)
960PROCT(K)
970PROCSO:SOUND1,-Z,60,1
980PROCP(X,Y-2):PRINTTAB(X,Y-3);"    "
990PROCT(K)
1000A=A-1
1010C=C-1
1020PROCD(A,B)
1030PROCP(X,Y-1):PRINTTAB(X,Y-2);"    "
1040SOUND1,-Z,60,1
1050PROCP(X,Y):PRINTTAB(X,Y-1);"    "
1060SC%=SC%+10
1070A=A-1:C=C-1:PROCD(A,B)
1080IF A=X OR A=X+1 OR A=X+2 THEN LI%=LI%-1:PROCC
RASH
1090IF C=X OR C=X+1 OR C=X+2 THEN LI%=LI%-1:PROCC
RASH
1100PROCSO:SOUND1,-Z,70,1
1110ENDPROC
1120DEFPROCT(T)
1130TIME=0:REPEATUNTILTIME?=T
1140ENDPROC
1150DEFPROCD(A,B)
1160IF L%=1 THEN A$=CHR$236:B$=CHR$237
1170IF L%=2 THEN A$=CHR$238:B$=CHR$239
1180IF L%=3 THEN A$=CHR$240:B$=CHR$241
1190IF L%=4 THEN A$=CHR$242:B$=CHR$242
1200IF L%=5 THEN A$=CHR$243:B$=CHR$244
1210IF L%=6 THEN A$=CHR$245:B$=CHR$246
1220IF L%=7 THEN A$=CHR$247:B$=CHR$248
1230IF L%=8 THEN A$=CHR$249:B$=CHR$250
1240IF L%=9 THEN A$=CHR$251:B$=CHR$252
```


KOMPLEX
LEGEND

```
1250IF LI%=10 THEN PROCSOME
1260COLOUR3:COLOUR130
1270PRINTTAB(C,0);A$;B$;:COLOUR128:PRINT"    ";
1280COLOUR2:COLOUR131
1290PRINTTAB(A,8);A$;B$;:COLOUR128:PRINT"    ";
1300IF A<=3 THEN A=36
1310IF C<=3 THEN C=36
1320PRINTTAB(0,12);"      ";
1330ENDPROC
1340DEFPROCCRASH
1350LI%=LI%-1
1360FORI=15 TO 1STEP-1:SOUND0,-I,12,1
1370SOUND0,-1,13,1
1380NEXTI
1390COLOUR3
1400PRINTTAB(I,Y);"    ";:PRINTTAB(I,Y+1);"    ";:PRINTTAB(I,Y+2);"    ";:PRINTTAB(A,8);"    ";
1410PRINTTAB(0,25);SPC(50)
1420PRINTTAB(I,Y-1);"    ";:PRINTTAB(I,Y+3);"    ";
1430PRINTTAB(0,12);"
        ";
1440X=3:A=36:C=18:IF R<=400 THEN PRINTTAB(17,23);"TIME UP":FORD=1TO100:NEXTD:PRINTTAB(23,23);SPC(4);
1450IF LI%<=0 THEN PROCEND
1460ENDPROC
1470DEFPROCNEXT
1480SC%=SC%+50
1490LX%=LX%+1:PRINTTAB(31,10);"      ";:PRINTTAB(31,11);"      ";:PRINTTAB(31,12);"      ";
1500IF LX%=2 OR LX%=4 OR LX%=6 OR LX%=8 THEN LI%=LI%+1
1510Q=3
1520W=13
1530PRINTTAB(34,9);CHR$229;
1540FORP=1TO3
1550SOUND2,-8,23,3:SOUND2,-8,40,3
1560Q=Q-3
1570NEXTP
1580ENDPROC
1590DEFPROCEND
1600IF SC%>HI% THEN HI%=SC%:FORW=100 TO 200 STEP12:SOUND1,-15,W,3:SOUND2,-15,W+8,2:NEXTW:GOTO1650
1610GOTO1650
1620PRINTTAB(0,29);SPC(100);
1630PRINTTAB(13,4);SPC(17);
1640INPUTTAB(0,29);"What is your name (max. 10 letters) ",N$:IF LEN(N$)>10 THEN 1620 ELSE PRINTTAB(0,29);SPC(40);
1650PRINTTAB(13,28);"0"
1660PRINTTAB(7,27);"Press 'SPACE' for another go"
1670REPEAT:UNTILGET=32
1680PRINTTAB(7,27);SPC(100);
1690SC%=0:LI%=5:LX%=1:R=290:GOTO240
1700ENDPROC
1710DEFPROCDONE
1720PRINTTAB(0,27);"Well done! You managed to Escape the "
1730PRINTTAB(0,28);"horrific stages of the 'Great Wall'"
1740FORI=1024 TO 0 STEP-4
1750SOUND1,-15,I/4,1
1760GCOL0,0:MOVE 0,I:DRAW 1279,I
1770NEXTI
1780GCOL0,7
1790PROCEND
1800END
1810ENDPROC
1820DEFPROCFREEZE
1830IF INKEY(-99) THEN ENDPROC
1840GOTO1830
1850ENDPROC
1860DEFPROCTIME
1870R=R-4
1880GCOL0,0
1890MOVE R,304:DRAW R,326
1900GCOL0,2
1910MOVE R+4,304:DRAW R+4,326
1920IF R<=406 THEN PROCCRASH:R=914:GOTO240
1930ENDPROC
1940DEFPROCSO
1950IF S=0 THEN Z=15
1960IF S=1 THEN Z=0 ELSE Z=15
1970ENDPROC
```



Render unto Caesar

Roman Numerels explained and tested on the CBM 64 brought to you by ***Peter Graves***

Roman numerals may be found on clock faces and monuments, as book chapter numbers and to denote the year of copyright of books, films and television programmes. As they use letters of the alphabet they can also be found in cryptic crossword clues.

Mathematically, Roman numerals are a curiosity as they use two bases (10 and 5), no zero, and a subtractive system of notation so that a smaller number to the left of a larger is subtracted from it. Thus XL (X = 10, L = 50) is decimal 40.

This program will convert Roman numerals to decimal or decimal to Roman and numbers in either form may be directly inputted. A practice mode is provided for both types of conversion but note that this part of the program will only recognise the simplest form of a Roman numeral using subtractive notation. Thus, 44 is converted as XLIV rather than the technically correct XXXXIIII. The main program will accept either form for conversion to decimal.

This is how it works. The input to the conversion subroutines is a string which is checked to see if its first character is a letter or a number. If it is a number it is sent for conversion to a Roman numeral. The number of thousands, hundreds, tens and units are counted and for each amount the corresponding Roman numeral character or pair of characters are looked up in an array. The highest number that the program will deal with is 4999. In Roman numerals 5000 has its own symbol and thus has not been included in the program.

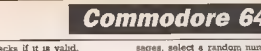
An input string with an alphabetical first character is assumed to be a Roman numeral. Because of the subtractive notation a direct conversion between each character and its decimal equivalent is not possible. Instead, starting from the left hand end of the input string, characters are taken in pairs. Each character is converted to its decimal equivalent checking at the same time that it is a valid character. The two numbers are compared. If the left hand one is smaller than the right then the pair are subtractive and the total is increased by the bigger minus the smaller. The next pair is then selected and the process repeated. If the pair is not subtractive, then the value of the left hand character is added to the total and the right hand character becomes the left hand character of the next pair. A dummy character is added to the input string so that its end can be detected; if a single character is left its value is added to the total.

The practice part of the program selects a random number between 1 and 4999 and converts it to the corresponding Roman numeral by calling up the appropriate conversion subroutine. A further random function decides if the user will be invited to convert the decimal number to a Roman numeral or vice versa. Whatever answer is inputted is compared with the correct one and an appropriate message is printed out. Two attempts are allowed before the correct answer is automatically provided.

Program Notes

400-660	Set up the data arrays and print out the initial screen messages
670	Input a string which may be a decimal number, Roman numerals or 'P' for practice
690-720	Decide what type the input is, if it is valid, if an error has occured (ie, an invalid character) in the Roman to decimal conversion, call up the appropriate subroutine and print out the result. Return to 670 for further input.
800-910	Subroutine to convert a deci-

```
200 REM
201 REM
202 REM ****************************
203 REM *                          *
204 REM *      ROMAN NUMERALS      *
205 REM *                          *
206 REM *            BY            *
207 REM *                          *
208 REM *       PETER GRAVES       *
209 REM *                          *
210 REM ****************************
211 REM
212 REM
400 REM INITIALISATION
410 DIM A(7),W$(7),X$(9),Y$(9),Z$(9)
420 FOR N=1 TO 9
430 READ X$(N),Y$(N),Z$(N)
440 NEXT
450 DATA C,X,I,CC,XX,II,CCC,XXX,III,CD,XL,
    IV,D,L,V,DC,LX,VI
460 DATA DCC,LXX,VII,DCCC,LXXX,VIII,CM,XC,IX
470 FOR N=1 TO 7
480 READ W$(N),A(N)
490 NEXT
500 DATA M,1000,D,500,C,100,L,50,X,10,V,5,I,1
510 POKE 53280,14 POKE 53281,14 POKE 646,1
600 PRINT "J" REM INITIAL SCREEN
610 PRINT TAB(6) "QQTU CONVERT ROMAN NUMERALS TO"
620 PRINT TAB(6) "DECIMALS OR DECIMAL TO ROMAN"
630 PRINT TAB(6) "ENTER THE NUMBER (DECIMALS"
640 PRINT TAB(6) "UP TO 4999, 'P' FOR PRACTICE)Q"
650 PRINT TAB(4) "M=1000    D=500    C=100    L=50Q"
660 PRINT TAB(10) "X=10     V=5      I=1Q"
670 INPUT N$ REM INPUT DECIMAL OR ROMAN
    NUMBER TO BE CONVERTED
680 IF N$="P" THEN 1300
690 F=ASC(LEFT$(N$,1))
700 IF F>64 THEN GOSUB 1100 IF ERR=0 THEN PRINT
    "J",,T,"QQ" GOTO 670
710 IF ERR=1 OR F<48 OR F>57 THEN PRINT ,,
    "JINVALIDQQ" ERR=0 GOTO 670
720 GOSUB 800 PRINT "J",,A$,"QQ" GOTO 670
800 REM CONVERT A DECIMAL NUMBER TO A
    ROMAN NUMERAL
810 M=INT(VAL(N$))
820 IF M>4999 OR M<0 THEN PRINT "QOUT OF RANGE FOR
    THIS PROGRAM" A$="" GOTO 910
830 A$=""
840 H=INT((M/1000))
850 I=INT((M-H*1000)/100)
860 J=INT((M-H*1000-I*100)/10)
870 K=INT((M-H*1000-I*100-J*10))
880 IF H=0 THEN GOTO 900
890 FOR N=1 TO H H$=A$+"M" NEXT
```



mal number between 1 and 4999 into the corresponding Roman numeral

830 Initialise answer string

840-870 Decide how many 1000's, 100's, 10's and 1's make up the input number

880 If there are no 1000's than jump to line 900

890 Add one 'M' to the answer string for each thousand in the number

900 Make up the rest of the Roman numeral by looking up the characters held in the arrays and adding them to the answer string

1000-1060 Subroutine that checks a single character from a Roman numeral, converts it to a decimal and checks if it is valid, setting the error flag if it is not The character is checked by comparing it in turn with all the possible characters (M,D,C,L,X,V,I), if a match is found than 'U' is set equal to the decimal equivalent of the character from a look up table held in an array

1100-1230 Subroutine to convert a Roman numeral into a decimal number The technique is described above If an error is detected (ERR=1) then the program jumps out of the subroutine and prints an error message

1300-1640 Practice subroutine

1310-1360 Print out the introductory messages, select a random number between 1 and 4999 and convert into the corresponding Roman numeral (which remains stored in A$)

1370 Electronically toss a coin to decide which type of conversion will be used

1380-1420 User is invited to convert the decimal number into a Roman numeral, the answer inputted is compared with the correct answer in A$. Two attempts (with appropriate error messages if the answer is incorrect) are allowed

1500-1540 As above except that the Roman numeral is printed out with the invitation to convert it to a decimal

```
900 A$=A$+X$(I)+Y$(J)+Z$(K)
910 RETURN
1000 REM VALIDATE SINGLE ROMAN CHARACTER AND
     CONVERT IT TO A DECIMAL
1010 FOR M=1 TO 7
1020 ERR=0
1030 IF N1$=W$(M) OR N2$=W$(M) THEN
     U=A(M) M=7 GOTO 1050
1040 ERR=1
1050 NEXT M
1060 RETURN
1100 REM CONVERT ROMAN TO DECIMAL
1110 T=0 V=1 N$=N$+" "
1120 N1$=MID$(N$,V,1) IF N1$=" " THEN 1220
1130 GOSUB 1000 N1=U N1$=""
1140 IF ERR=1 THEN 1220
1150 V=V+1 N2$=MID$(N$,V,1)
1160 IF N2$=" " THEN T=T+N1 GOTO 1220
1170 GOSUB 1000 N2=U N1$=""
1180 IF ERR=1 THEN 1220
1190 IF N1=>N2 THEN T=T+N1 GOTO 1120
1200 T=T+N2-N1 V=V+1 GOTO 1120
1210 GOTO 1120
1220 RETURN
1300 REM PRACTICE
1310 PRINT ""
1320 PRINT TAB(15) "PRACTICE"
1330 PRINT TAB(15) "--------"
1340 PRINT TAB(10) "ENTER 'E' TO EXIT"
1350 M=INT((4998)*RND(1))+1
1360 GOSUB 830 N=0
1370 IF RND(1)>0.5 THEN 1500
1380 REM CONVERT A DECIMAL
1390 PRINT "",M," AS A ROMAN NUMERAL ",
     INPUT G$ IF G$="E" THEN 600
1400 IF G$=A$ THEN PRINT TAB(16)
     "CORRECT" GOTO 1350
1410 N=N+1 IF N<2 THEN PRINT TAB(10)
     "INCORRECT, TRY AGAIN" GOTO 1380
1420 PRINT "CORRECT ANSWER IS ";
     A$ PRINT "" GOTO 1350
1500 REM CONVERT A ROMAN NUMERAL
1510 PRINT "",A$," AS A DECIMAL",
     INPUT G$ IF G$="E" THEN 600
1520 IF VAL(G$)=M THEN PRINT TAB(16)
     "CORRECT" GOTO 1350
1530 N=N+1 IF N<2 THEN PRINT TAB(10)
     "INCORRECT, TRY AGAIN" GOTO 1510
1540 PRINT "CORRECT ANSWER IS ",
     M PRINT "" GOTO 1350
```

Pre-packaged

Keybeeping BBC's and personalised programs all in one routine – from ***Cy Noble***

This routine uses the 'event' pre-packaged interapt routine which is triggered by any character entering the keyboard buffer. When the 'event' is triggered, the standard operating system is intercepted (via the vector at £220 in Ram), re-directed to the *beep* routine and then directed back to continue where it left off. Copious documentation in the program itself gives you a blow by blow description of what is happening at all times.

There is another operating system routine which is called on hitting the *Break* key. It prints what you see at the top of the screen after a break. We intercept that in a similar manner so that it prints a personalised header.

This one is a little trickier to program in that the OS routine is directed through the intercept vector twice, the first time with the carry flag clear and the next time with it set. We don't want to call the *beep* routine twice because the system gets hung up if you do that (try it and see), so what happens is that on *Break*, the interrupt enable is cancelled and not re-enabled until the second time the *Break* routine comes round. This second time we call the *beep* routine and it is re-enabled just the once.

For disc users the program works as it stands and will survive both soft and hard breaks as long as the code is not overwritten by another program.

For cassette users it will be okay at *&D01* but *not &D00* because that is corrupted by the NMI OS routine on *Break*. To change the location of the program just change Line 10

10 Start = &XXXX

11 Rem *&900* if disc -*&D01* if cassette

To save disc space and typing you can leave out anything in the listing after the '/' sign, which is the assembler equivalent of Rem. You can also **Save* just the machine code itself as follows. Run the program then type: *Print-Break <RETURN>*

The number you get is the execution address of the program. Now type **Save Beep 900 9FF Break 900* where Break is the number you got *in Hex*. Do not prefix these numbers with '&' as the OS takes them for hex numbers anyway. The machine code is saved as a block and when run from disc or tape the *Break* address is the calling address of the routine.

Hit the *Break* key and you should get a header printed in colours at top centre above the messages you normally get. From now until switch off (if you don't overwrite the machine code at *&900*) you will get a soft beep on every keyhit, if not than check your listing carefully.

Finally, the program as written will only work if Basic 2 is installed because of the *Equs,Equb* and *Equd* usages. If you intend to do much machine coding then do get the Basic 2 chip if you haven't already got it.

To find out type *Report*, hit *Return* and you'll get *'(c) Date Acorn'*. If the date is 1982 or later you've got Basic 2.

```
  10START=&900:REM CHANGE TO SUIT
  20OSBYTE=&FFF4
  30OSWRCH=&FFEE
  40OSNEWL=&FFE7
  50PROCASS
  60CALL BREAK
  70END
  80DEFPROCASS
  90FORPASS=0TO1
 100P%=START
 110[OPT PASS*3
 120SEI           \disable interupts
 130LDA &0220     \get the old vector
 140STA &0230     \and save it in spare
 150LDA &0221     \vector space so that
 160STA &0231     \we can direct the O.S
 170LDA £(EVNT MOD256) \back to where
 180STA &0220     \it was when we inter-
 190LDA £(EVNT DIV256) \rupted it.Now
 200STA &0221     \our EVNT serviced
 210              \on any keypress by
 220LDA £&0E      \the osbyte routine
 230LDX £&02      \enabling event 2
 240JSR OSBYTE \(char entering buffer)
 250:
 260LDA £&D5      \These next three
 270LDX £&C8      \osbyte calls alter
 280LDY £&00      \the pitch
 290JSR OSBYTE
 300LDA £&D6      \the duration
 310LDX £&01
 320LDY £&00
 330JSR OSBYTE
 340LDA £&D4      \and the volume
 350LDX £&AB      \of the beep
 360LDY £&00
 370JSR OSBYTE
 380CLI           \enable interupts again
 390.BREAK        \This osbyte call puts
 400LDX£&4C       \a JMP instruction at a
 410LDY£0         \location which is
 420LDA£&F7       \checked whenever break
 430JSR OSBYTE \key is hit. Now it
 440LDX£(PR MOD256)
 450LDY£0         \will jump to our
 460LDA£248       \PR(inting) routine.
 470JSR OSBYTE \routine on break
 480LDX£(PR DIV256)
 490LDY£0
 500LDA£249
 510JSR OSBYTE
 520.EVNT          \Check if it is
 530CMP £&02       \'our' event
 540BEQ BEEP       \branch to beep if so
 550JMP (&0230) \jump out if not
 560.BEEP
 570PHA:TXA:PHA \save A,X on the stack
 580LDA £&07       \make the
 590JSR OSWRCH     \beep
 600PLA:TAX:PLA \retrieve X,A
 610JMP (&0230) \and finish
 620RTS
 630\ ***** PRINT HEADER ROUTINE *****
 640.PR \OS break routine calls twice
 650BCC P1  \(with carry clear 1st) but
 660JSR&900 \we only call beep once to
 670        \avoid getting hung up
 680.P1           \The main printing
 690LDX £4        \routine gets the
 700.prin1        \date set up below
 710LDA tab1,X    \First the equivalent
 720JSR OSWRCH    \of vdu 31,x,y,colour
```

```
730DEX           \code then the
740BPL prin1     \copyright string
750.prcopy LDA copy,X
760JSR OSWRCH
770INX
780CPX£(name-copy)
790BNE prcopy
800LDX£4
810.ptab2          \ As P1 etc.
820LDA tab2-1,X
830JSR OSWRCH
840DEX
850BNE ptab2
860.prname
870LDA name,X
880JSR OSWRCH
890INX
900CPX£(beep-name) \ compare x with
910BNE prname    \ length of name
920JSR OSNEWL    \ new line when done
930LDX£4
940.ptab3          \ As for P1 etc
950LDA tab3,X
960JSR OSWRCH
970DEX
980BPL ptab3
990INX
1000.prbeep
1010LDA beep,X
1020JSR OSWRCH
1030INX
1040CPX £tab1-beep
1050BNE prbeep
1060JSR OSNEWL
1070.FIN
1080RTS
1090.copy
1100EQUS"(C) 1985" \or another message
1110.name          \ put your own name
1120EQUS"Own Name" \ in here
1130.beep
1140EQUS"Beep on"
1150.tab1          \ The three tabs are
1160EQUD %1F0C0086 \ equivalent to vdu
1170.tab2          \ 31,x,y,colour code
1180EQUD %1F0C0185
1190.tab3
1200EQUD %1F0C0281
1210EQUB %88
1220RTS
1230]
1240NEXT
1250ENDPROC
```

Round and round

Draw really fast circles on your Amstrad with the help of **B J Wetheiet**

There have been several routines published already about drawing fast circles on the Amstrad but these are really fast! They work by first *Pokeing* the coordinates of a given 90 degree arc and then *Drawing* the complete shape from machine memory

Both programs are quite memory consuming but can be shortened considerably in actual use They are shown here with safeguards to prevent crashing and to demonstrate how they work

With Program One set any *Mode*,*Run* and the screen will clear as values are *Poked* *x%*&*y%* are integers 0-255 and *st*=9 is about the best for quick circles/ellipses, although any value can be tried to give squares, octagons etc

Once the values have been *Poked* and the circle or what-ever *Drawn*, subsequent *Run* commands skip straight to the *Draw* section of the routine

Moving the *Origin* means, of course, that the shape can be *Drawn* any number of times anywhere on the screen

All that really differs between Program Two and the first listing is in the *Draw* routine. Here, step *st* must be smaller by several times

This routine (as 1) sets the variables to suit, and *Pokes* then *Draws*, filling the shape from left to right

If, in either program, you break whilst values are being *Poked*, strange things may happen when the program is run If this does occur reset the memory by entering variables for a larger shape in Mode 2

Program One – Circles

orx%,*ory%*	Coordinates of origin.
x%,*y%*	Radii of circle/ellipse:integers 0-255
st	Step size in degrees
a	Angle in 90 deg arc POKE routine
c	Count in 90 deg arc POKE routine
b	Count in main DRAW routine

Line No	
100	Sets variable, Deg mode & Origin
110	Checks st,x%,y% (& HIMEM) If they agree with those in memory goes to Line 160 and Draws if new values have been entered then sets new HIMEM
120	Sets a&c to zero which is important when using the routine more than once in a program. It also *Pokes* x% and y% values
130-150	*Poke* new values for the 90 deg arc
160 200	*Draw* the complete shap anti-clockwise from 9 o'clock

Program Two – Discs

100	As 1 but branches up to 240 to set the step size to ensure that all lines are drawn adjacent to each other
110	Sets the step to suit the pixel width in different MODEs
120-170	As listing 1
180-230	*Plot* and *Draw* lines point to point across the shape as defined in the *Pokes*. *Draws* from left to right.
240-	These contain step sizes st, all factors of 90 to give the quickest completely filled shapes corresponding to the radii.

```
5 REM DISC ROUTINE
100 orx%=320:ory%=200:x%=140:y%=140:m=0:MO
DE m:ORIGIN orx%,ory%:DEG:GOTO 240
110 IF m=1 OR m=2 THEN st=st/m ELSE st=st*
2      :REM Set st for MODE m
120 IF NOT (HIMEM=(43903-((90/st)*2+2)) AN
D x%=PEEK(43903) AND y%=PEEK(43902))  THEN
 MEMORY 43903-((90/st)*2+2):GOTO 130 ELSE
180:REM Check for changed values
130 a=0:c=0:LOCATE 1,1:PRINT"POKEing new v
alues":POKE 43903,x%:POKE 43902,y%
140 MOVE   x%*COS(ROUND(a,3)),y%*SIN(ROUND
(a,3)) :REM POKE new values
150 POKE HIMEM+c,XPOS:POKE HIMEM+c+1,YPOS
160 a=a+st:c=c+2:IF a<=90 THEN 140
170 CLS
180 c=0  :FOR b=0  TO 90/st
       :REM Main DRAW routine
190 PLOT -PEEK(HIMEM+c),-PEEK(HIMEM+c+1)
       :REM LHS
200 DRAW -PEEK(HIMEM+c), PEEK(HIMEM+c+1):c
=c+2:NEXT
210 c=c-4:FOR b=1  TO 90/st
       :REM RHS
220 PLOT  PEEK(HIMEM+c), PEEK(HIMEM+c+1)
230 DRAW  PEEK(HIMEM+c),-PEEK(HIMEM+c+1):c
=c-2:NEXT:END
240 IF x%<=255 AND x%>230 THEN st=0.4 :GOT
O 110  :REM Set step to suit radius
250 IF x%<=230 AND x%>140 THEN st=0.5 :GOT
O 110
260 IF x%<=140 AND x%>110 THEN st=0.75:GOT
O 110
270 IF x%<=110 AND x%>75  THEN st=1   :GOT
O 110
280 IF x%<=75  AND x%>50  THEN st=1.5 :GOT
O 110
290 IF x%<=50  AND x%>40  THEN st=2   :GOT
O 110
300 IF x%<=40             THEN st=3   :GOT
O 110
```

```
5 REM CIRCLE ROUTINE
100 orx%=320:ory%=200:x%=160:y%=160:st=9:O
RIGIN orx%,ory%:DEG
110 IF NOT (HIMEM=43903-((90/st)*2+3) AND
x%=PEEK(43903) AND y%=PEEK(43902))    THEN
 MEMORY 43903-((90/st)*2+3):GOTO 120 ELSE
160:REM Check for changed values
120 a=0:c=0:PRINT"POKEing new values":POKE
 43903,x%:POKE 43902,y%
130 MOVE x%*COS(a),y%*SIN(a)
       :REM POKE new values
140 POKE HIMEM+c,XPOS:POKE HIMEM+c+1,YPOS
150 a=a+st:c=c+2:IF a<=90 THEN 130
160 MOVE -PEEK(HIMEM),-PEEK(HIMEM+1):CLS
       :REM Main DRAW routine
170 c=0  :FOR b=0  TO 90/st:DRAW -PEEK(HIM
EM+c),-PEEK(HIMEM+c+1):c=c+2:NEXT
180 c=c-4:FOR b=1  TO 90/st:DRAW  PEEK(HIM
EM+c),-PEEK(HIMEM+c+1):c=c-2:NEXT
190 c=0  :FOR b=0  TO 90/st:DRAW  PEEK(HIM
EM+c), PEEK(HIMEM+c+1):c=c+2:NEXT
200 c=c-4:FOR b=1  TO 90/st:DRAW -PEEK(HIM
EM+c), PEEK(HIMEM+c+1):c=c-2:NEXT
210 END
```

Second time around

*A menu-driven Boot routine for the new Psion software packages written by **Lindsay Roome***

Have I stopped slaving over a hot keyboard since my 'freebie' update cartridges (courtesy of my Qlub membership) dropped through the letterbox last week? Have I seen the family recently? Have I got square eyes? Read on!

Thanks Psion, thanks Uncle Clive – the new versions are great – but when will we get them on a Rom cartridge?

The most noticeable improvement of the Version Two software is the speed at which it now loads and operates. It is also immediately obvious that on quitting a package, the new versions return to Superbasic instead of resetting the machine. The boot routine is still resident in memory and on *Quit*, will re-open the screen channels and then stop waiting for Basic commands. This implies that the machine would continue to execute a Basic program loaded by the initial boot command.

The following program is an alternative boot routine, which I have written and substituted for the original on my own Version Two cartridges. Incidentally, the working copies have been cloned on to the original Version One cartridges leaving the original cartridges of Version Two intact as master copies. That simply means that my working copies now have the flashy Psion labels on the cartridges!

Program Notes

I use the system clock frequently in my applications of the packages, so on booting the system, the screen politely says *"Hallo"* and asks you to set the clock by single keystroke input. (Lines 10-210 could be omitted if you do not wish to set the clock)

A menu is then displayed, which again requires a single keystroke to select one of the four Psion packages.

There is also an option to *New* the system and remain in Superbasic with no resident program. Other utilities could also be loaded with some simple modifications to the program. On quitting a software package, the menu is displayed and another package may be selected ad infinitum.

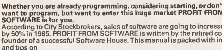
```
10 REMark              BOOT MENU
20 REMark   (QL software - version 2.00)
30 REMark
40 REMark       (c) Lindsay Rooms 1985
50 REMark
60 CLS:CSIZE 2,1
70 AT 3,12:PRINT "HELLO LINDSAY"
80 AT 5,8:FLASH 1: PRINT"SET THE CLOCK
   PLEASE":FLASH 0
90 PRINT:PRINT"    ";
100 INPUT"year ?";a;
110 PRINT" ";
120 INPUT"month ?";b;
130 PRINT" ";
140 INPUT"day ?";c;
150 PRINT" ":PRINT"    ";
160 INPUT"hour ?";d;
170 PRINT" ";
180 INPUT"minute ?";e;
190 PRINT" ";
200 INPUT"second ?";f;
210 SDATE a,b,c,d,e,f
220 CLEAR
230 WINDOW 512,256,0,0:CLS:CSIZE 2,1
240 CLS
250 AT 0,3:PRINT "WHICH PROGRAMME? - Pre
    ss a Key"
260 AT 1,3:PRINT "***** *********"
270 AT 2,2:PRINT"1       ABACUS"
280 AT 4,2:PRINT"2       ARCHIVE"
290 AT 6,2:PRINT"3       EASEL"
300 AT 8,2:PRINT"4       QUILL"
310 AT 10,2:PRINT"5       BASIC"
320 LET n$=INKEY$(0)
330 IF n$="1"THEN LET a$="ABACUS"
340 IF n$="1" THEN LET b$="spreadsheet"
350 IF n$="1"THEN GO TO 500
360 IF n$="2"THEN LET a$="ARCHIVE"
370 IF n$="2" THEN LET b$="database"
380 IF n$="2"THEN GO TO 500
390 IF n$="3"THEN LET a$="EASEL"
400 IF n$="3" THEN LET b$="business grap
    hics"
410 IF n$="3"THEN GO TO 500
420 IF n$="4"THEN LET a$="QUILL"
430 IF n$="4" THEN LET b$="word process
    or"
440 IF n$="4"THEN GO TO 500
450 IF n$="5"THEN PAPER#1,7:PAPER#2,7:PA
    PER#0,7
460 IF n$="5"THEN INK#1,1:INK#2,1:INK#0,1
470 IF n$="5"THEN MODE 256
480 IF n$="5"THEN NEW
490 GO TO 320
500 CLS:AT 2,2:PRINT"Insert ";a$;" Cartri
    dge into MDV1"
510 AT 3,2:PRINT"and  DATA Cartridge into
     MDV2"
520 FLASH 1:AT 10,9:PRINT"Press any key
    to load":FLASH 0
530 PAUSE
540 CLS
550 AT 2,10:FLASH 1:PRINT "LOADING QL ";
    a$:FLASH 0
560 AT 4,4:PRINT b$
570 AT 4,21:PRINT "- version 2.00"
580 AT 6,4:PRINT "copyright  1984 PSION
    SYSTEMS"
590 AT 8,11:PRINT "*** LPR 1985 ***"
600 AT 10,9:PRINT DATE$
610 IF n$="1"THEN GO SUB  670
620 IF n$="2"THEN GO SUB  700
630 IF n$="3"THEN GO SUB  730
640 IF n$="4"THEN GO SUB  760
650 OPEN #1,scr:OPEN #2,scr
660 GO TO 220
670 CLOSE #1:CLOSE #2:WINDOW #0,400,20,35
    ,215
680 EXEC_W mdv1_abacus
690 RETurn
700 CLOSE #1:CLOSE #2:WINDOW #0,400,20,35
    ,215
710 EXEC_W mdv1_archive
720 RETurn
730 CLOSE #1:CLOSE #2:WINDOW #0,400,20,35
    ,215
740 EXEC_W mdv1_easel
750 RETurn
760 CLOSE #1:CLOSE #2:WINDOW #0,400,20,35
    ,215
770 EXEC_W mdv1_quill
780 RETurn
```

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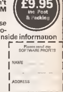
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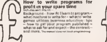
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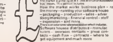


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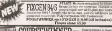


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Spectrum

Flashes of inspiration

Convert your Spectrum into an amazing sound-to-light machine with the help of ***Andrew Burgess***

This program, for the 48k Spectrum only, will take sound coming in through the ear socket and turn it into a fantastic graphical pattern on the TV screen.

The program works by first storing 24 different patterns in memory. The first pattern would be a small one, and the last one would be very large. These are stored in order to represent the volume of sound entering the ear socket. Once these have been stored, the machine code can be entered which scans the ear socket approximately 35 000 times a second (35 Kilo-Hertz). If there is a click at the ear socket then the pattern number is incremented unless it reaches its maximum. If there is no click then the pattern number is decremented unless it reaches zero. The loop is repeated until the space key is pressed.

However, the program uses what are called 'interupts', a feature of the Z80 chip which cannot be praised enough! What this really boils down to is that every fiftieth of a second, the pattern number is taken and the correct pattern is displayed. this all happens at the same time as the ear socket loop is being executed, so it is like two separate programs running at the same time. Without using interupts, the program would only loop round approximately 2,000 times a second!

Here is how to type in the program. First type in Program One. Save this at the start of a tape with *Save "prog one" Line 9999*. Do not attempt to run this program yet, as it contains calls to non-existent machine code.

New the computer and type in Program Two. *Run* it, and enter the numbers from the machine code dump listing. After you have entered five numbers, you will be asked to enter a check-sum. If this is incorrect then you will have to re-enter the last five bytes again. The program will *Save* the machine code when you have typed it all in, so make sure you put it directly after Program One.

To test the program, reset the computer and *Load* "prog one". If all is well you should see coloured blocks filling the screen, and a number in the top left hand corner. When this reaches '24' (it takes about four minutes) the program will then start "listening".

Leaving everything as it was for *loading*, put your favourite cassette in the tape player (a music cassette, not Space Invaders!), and press play. If all is well you should see the patterns of coloured blocks dancing with the music.

Try turning the volume down so you still get a good display, and pull the plug on the ear lead out slightly, so you can hear the music at the same time as seeing it. If you have a stereo with left and right speaker sockets, you could put the ear lead into the left socket and listen out of the right speaker. Be carefull not to put a too strong a current into the Spectrum, nothing more than normal Loading with volume.

Program One

```
  10 LET routine=500
  20 LET v=32768
  30 FOR l=1 TO 24
  40 GO SUB routine
  50 POKE 51969,v-256*INT (v/256
) POKE 51970,INT (v/256)
  60 LET j=USR 51968
  70 LET v=v+768
  80 NEXT l
  90 CLS
 100 RANDOMIZE USR 52000
 110 STOP
 500 REM ************************
 510 REM *                      *
 520 REM * To use this routine  *
 530 REM *  change the number   *
 540 REM *  in line 10 to 500   *
 550 REM *                      *
 560 REM ************************
 565 CLS
 566 PRINT AT 0,0, PAPER 0,l
 570 FOR n=0 TO (l-1)*3
 580 LET c=INT (RND*6)+1
 590 LET s=INT (RND*3+1+(RND>.9)
)
 600 LET x2=l*.96: LET y2=l*1.28
 610 LET x=16+INT (RND*x2-x2/2)
 620 LET y=16+INT (RND*y2-y2/2)
 630 GO SUB 9000
 640 IF f=1 THEN GO TO 580
 650 NEXT n
 660 RETURN
1000 REM ************************
1010 REM *                      *
1020 REM * To use this routine  *
1030 REM *  change the number   *
1040 REM *  in line 10 to 1000  *
1050 REM *                      *
1060 REM ************************
1070 CLS
1080 CIRCLE PAPER RND*6+1,127,87
,l*3.625
1090 RETURN
9000 REM ************************
9010 REM *                      *
9020 REM *   This sub-routine   *
9030 REM *   will draw a box    *
9040 REM *   at x,y , colour c, *
9050 REM *   size s,            *
9060 REM *   If the box goes    *
9070 REM *   off the screen,    *
9080 REM *   a return will be   *
9090 REM *   made with f=1      *
9100 REM *                      *
9110 REM ************************
9120 LET f=0: IF x<0 OR y<0 OR x
>24-s OR y>30-s THEN LET f=1: RE
TURN
9130 FOR a=0 TO s-1
9140 FOR b=0 TO s-1
9150 POKE 22528+y+a+((x+b)*32),c
*8
9160 NEXT b
9170 NEXT a
9180 RETURN
9999 POKE 65278,41: POKE 65200,2
03: BORDER 0: PAPER 0: INK 7: CL
EAR 31999: LOAD ""CODE : RUN
```

Program Two

```
  10 FOR a=51968 TO 52093 STEP 5
  20 LET cs=0
  30 PRINT AT 21,5,a,": ",
  40 FOR l=0 TO 4
  50 INPUT x
  60 LET cs=cs+x
  70 POKE a+l,x
  80 PRINT x,",",
  90 NEXT l
 100 INPUT "checksum  ",cs2
 110 IF cs2<>cs THEN PRINT AT 21
,0, FLASH 1,"ERROR": BEEP 1,0: P
RINT AT 21,0,"
                 ": GO TO 20
 120 RANDOMIZE USR 3582: RANDOMI
ZE USR 3280
 130 NEXT a
 140 SAVE "sc"CODE 51968,200
 150 STOP
```

Machine Code Dump

addr.	contents	cs
51968	17,5,145,33,0	190
51973	88,1,5,3,237	329
51978	176,201,0,0,0	377
51983	0,0,0,0,0	0
51988	0,0,0,0,0	0
51993	0,0,0,0,0	0
51998	0,0,62,254,237	553
52003	71,237,94,195,71	668
52008	203,243,245,197,213	1101
52013	229,58,127,203,87	704
52018	30,0,33,0,122	185
52023	25,17,0,88,1	131
52028	0,3,237,176,225	641
52033	209,193,241,251,237	1131
52038	77,62,127,219,254	739
52043	31,216,58,203,237	745
52048	58,82,63,237,71	519
52053	201,219,254,254,191	1119
52058	194,118,203,58,127	692
52063	203,254,72,202,71	802
52068	203,58,60,55,50	433
52073	127,203,195,71,203	799
52078	58,127,203,254,3	645
52083	202,71,203,61,61	598
52088	51,58,127,203,195	635
52093	71,203,3,0,0	277

Open Forum

We are always actively seeking programs for publication – either for Open Forum, the machine pages or Star Game. When sending in a program for consideration, a clear program listing should be sent together with, wherever possible, a saved copy on cassette. Documentation – usually not more than 1000 words – should start with a general description of the program, what it does, and then some detail of how the program itself is constructed. We pay very competitive rates, according to the length and nature of the program and the quality of the accompanying documentation.

Solgar

on Spectrum

This program came from an idea by Andy Hennigan who wrote a version of *Solgor* for the Commodore Pet, this version for the Sinclair ZX Spectrum was written from scratch and borrows none of the original programming.

Solgor is a game for those people who enjoy puzzles (such as Rubik's Cube). It involves sorting out numbers into ascending order.

At the start the computer jumbles up the digits 0-9. Then all you have to do is put them back in their original order, ie 0-9.

This is done by reversing the first 'n' numbers where n is a whole number between 1 and 10.

To save the program use – *RESTORE SAVE "SOLGOR"LINE 500* and *ENTER*.

And don't worry if you don't get the hang of it at first. it's a lot easier than it looks!

```
  10 REM
  20 REM     SOLGOR
  30 REM  © 1983 Andrew Wiseman
  40 REM
  60 GO SUB 1000   REM udg
  68 GO SUB 3000   REM instns
  70 GO SUB 2000   REM initialise
                        & screen
  80 GO SUB 4000   REM and game
 100 BORDER 7  PAPER 7  INK 0  C
LS  PAUSE 0  STOP
 500 RUN
1000 REM user defined graphics
1010 FOR a=1 TO 8  READ a$  FOR
n=0 TO 7  READ L  POKE USR a$+n,
L  NEXT n  NEXT a
1011 LET h$=26  LET h$="
1020 RETURN
1030 DATA "a",0,127,64,95,80,80,
80,80,"b",0,255,0,255,0,0,0,0,"c
",0,254,2,250,10,10,10,10
1060 DATA "d",80,80,80,80,80,80,
80,80,"e",10,10,10,10,10,10,10,1
0,"f",80,80,80,80,95,64,127,0
1080 DATA "g",0,0,0,0,255,0,255,
0,"h",10,10,10,10,250,2,254,0
2000 REM screen/initialise
2010 BORDER 0  PAPER 0  INK 0
2020 CLS  PRINT L$
2040 PRINT OVER 1,AT 0,0,U$,a$,
a$,a$,L$
2045 INK 7
2050 PRINT AT 7,0,"Press a key t
o jumble the digits"
2060 LET n$="0123456789"
2061 PRINT AT 9,11,n$
2062 PAUSE 0  PRINT AT 7,0
2065 PRINT AT 9,0, OVER 1, INK 5
,U$,a$,a$,a$,a$,a$,L$  U$,a$,a$,
a$,a$,a$,a$,a$,L$
2068 LET j$=""
2070 FOR a=0 TO 9
2080 LET r=INT (RND*10)+1
2090 IF n$(r)=" " THEN GO TO 208
0
2100 LET j$=j$+n$(r)  LET n$(r)=
" "
2110 PRINT AT 9,12, FLASH 1,j$:
BEEP .05,0
2120 NEXT a
2125 INK 4
2130 PRINT AT 11,1,"[graphics]"
2140 PRINT AT 12,1,"[graphics]"
2150 PRINT AT 13,1,"[graphics]"
2155 PRINT AT 14,0, INK 0," 1  2
 3  4  5  6  7  8  9"
2156 FOR a=-12 TO 12  BEEP .1,a
 NEXT a
2157 PRINT AT 9,0, INK 5,a$
2158 INK 7
2160 REM main loop
2161 LET t=1
2165 GO SUB 9000  REM print j$
2170 FOR a=1 TO 50  NEXT a  PRIN
T AT 0,0, INK 5,a$
2180 PRINT AT 16,1,"From which b
ox is this figure",AT 17,9,"to
be reversed?",AT 19,1, INK 6,"Pr
ess number under the box or",AT
20,7,"q  to quit"
2190 PRINT AT 8,13,"TURN 0",AT 8
,19-(1 AND LEN STR$ t=2),t
2200 PAUSE 0  LET i$=INKEY$
2201 LET q=0  IF i$="q" THEN LET
q=1  LET t=101  PRINT AT 14,0,
INK 5,a$  RETURN
2210 IF i$<"1" OR i$>"9" THEN GO
TO 2200
2220 PRINT AT 15,0, INK 5,a$,a$,
a$,a$,a$
2230 LET k=VAL i$+1  LET k$=
""
2240 FOR i=1 TO k  LET k$(i)=j$(
k-i+1)  NEXT i
2250 LET j$=k$( TO k)+j$(k+1 TO
)
2251 FOR i=2 TO k*3 STEP 3  NEXT
 i
2253 PRINT AT 14,i-4, OVER 1, FL
ASH 1,"[redacted]"  PAUSE 50
2256 GO SUB 2900
```

The Music Box

Musical occasion

I was pleased to be invited to address the Home Office Amateur Computing Club the other week when the club held a lunchtime meeting on the subject of computer music.

In fact, the meeting consisted of presentations by club members – on a Commodore 64 and a BBC Model B – followed by an all-too brief discussion. The presentations focused on commercial software utilising the 64 and the BBC's PSGs, and it was clear that there is a great deal of interest in easy-to-use performance packages (particularly those utilising peripheral music keyboards) and in flexible composing packages (word-processors for composers and arrangers). Unfortunately, there aren't too many of these around as yet, so the choice is not great.

Autographics' Microsound keyboard for the 64 (the original version) was put through its impressive paces and I was pleased to be able to show Island Logic's *The Music System* for the BBC. These seem more and more like state-of-the-art as far as micro music is concerned and I for one am eager to see the projected Commodore version of TMS.

It was encouraging to see how far people had progressed from plinks, crashes and zaps, and also that interest in the musical potential of the micro cut across the musicians and computer users. There were about 30 people at the meeting and it was also encouraging to see a number of women there.

This was my first visit to the 'corridors of power', and I'm pleased to report that, while the predominant colour is grey, there are occasions for music. I must thank Bob Armstrong, who organises the HOACC meetings and invited me (in between liaising with the Channel Islands and the Isle of Man). I'd also like to thank all those who made the meeting so interesting. If you happen to work in the Home Office, or in the area of Queen Anne's Gate in London, I'm sure HOACC will be pleased to hear from you.

The Music Box is a weekly column with news, reviews and readers comments on all aspects of micros and music.

Any readers with experience of computer music making or companies with new product news are invited to write to drop a line explaining what they're doing to Gary Herman, The Music Box, 12-13 Little Newport Street, London WC2R 3LD

Open Forum

```
2200 LET t=t+1 IF j$="0123456789" THEN GO SUB 2900 PRINT AT 16,0, INK 5,a$ FOR a 1 TO 10 BEEP .1,30 BEEP .1,20 NEXT a RETURN
2275 LET a$=" "
2280 IF t-1=20 THEN LET m$="You're not very good, are you?"
2290 IF t-1=24 THEN LET m$="  This is your last chance"
2295 IF t-1=20 THEN LET m$="Only 3 more turns left!
2300 IF t-1=25 THEN PRINT AT 14,0, INK 5,a$,AT 7,1,"  Terrible!" BEEP 1,-10 BEEP 1,-5 PRINT INK 5,"Your turns are up." BEEP 1,-5 BEEP 1,-10 LET q=1 RETURN
2301 PRINT AT 7,1, INK 5,m$ FOR a=1 TO 8+(6 AND m$<>"  ") BEEP .01,10: BEEP .01,8 NEXT a
2305 PRINT AT 14,i-4, INK 6, OVER 1, FLASH 0,
2310 GO TO 2170
2899 STOP
2900 LET c=1 FOR a=2 TO 29 STEP 3
2910 PRINT AT 12,a,j$(c) PRINT AT 7,a-1," " LET c=c+1
2919 NEXT a
2920 RETURN
4000 REM end game
4010 PAPER 1 INK 0
4020 PRINT AT 6,0,u$ FOR a=6 TO 20 PRINT AT a,0,a$ NEXT a PRINT AT 21,0,l$
4030 PRINT OVER 1,AT 8,0,
ME    OVER   GA
4034 IF a=1 AND h$="" THEN PRINT INK 7, PAPER 0,AT 13,4,"Better luck next time!" GO TO 4100
4035 IF t-1>hs THEN GO TO 4050
4036 LET hs=t-1
4040 POKE 23658,8 PRINT FLASH 1, OVER 1,AT 13,3," CONGRATULATIONS! YOU HAVE ",AT 14,3,"ACHIEVED THE BEST SCORE" INPUT AT 0,0,"Please enter your name..." LINE h$ POKE 23658,0
4041 PRINT AT 13,0,a$,a$ IF LEN h$>32 THEN LET h$=h$( TO 32)
4050 PRINT AT 10,5, INK 7,"The best Yet is from"
4055 PRINT AT 12,4, PAPER 0,"         REM 24 spaces
4060 PRINT INK 7, PAPER 0,AT 12,((32-LEN h$)/2),h$
4070 PRINT AT 14,1, INK 7,"who rearranged the numbers in" LET p$="only "+STR$ hs+" turns." PRINT INK 7,AT 16,(32-LEN p$)/2,p$
4100 PRINT AT 18,0, PAPER 1, OVER 1, INK 6," Do you wish to play again?",TAB 16,"type y - for yes",TAB 16,"type n - for no."
4101 IF t-1=25 THEN PRINT AT 17,0, PAPER 1,"That was terrible!      Do you wish to try again?
4110 PAUSE 0 IF INKEY$="n" THEN RETURN
4120 IF INKEY$="y" THEN PRINT AT 18,0, PAPER 1, FLASH 1,"Do you wish instructions again? " GO TO 4138
4130 GO TO 4110
4138 BEEP 1,50
4140 PAUSE 0 IF INKEY$="y" THEN GO SUB 5100 GO TO 70
4150 IF INKEY$="n" THEN GO TO 70
4160 GO TO 4140
5000 REM instructions
5010 POKE 23658,0 BORDER 3 PAPER 0 INK 5 OVER 0 INVERSE 0 FLASH 0 BRIGHT 0 CLS
5020 LET u$=CHR$ 23+CHR$ 4 LET l$=CHR$ 22+CHR$ 1+CHR$ 3+
"SOLGOR +U$+ +U$+
5030 PRINT l$
5051 LET a$="
5052 LET u$="
5053 LET l$="
5060 PRINT OVER 1,AT 0,0,u$,a$,a$,a$,l$, PAPER 3,,, PAPER 0,u$ FOR a=1 TO 10 PRINT a$ NEXT a PRINT l$, PAPER 3,,
5070 PRINT AT 5,0, INK 5, OVER 1,"   Do you wish instructions?",AT 12,5,"Please type y - for yes",TAB 17,"n - for no."
5080 PRINT AT 18,0,u$,"     © 1983 Andrew Wiseman      ",l$
5090 PAUSE 0 IF INKEY$="n" THEN RETURN
5099 IF INKEY$<>"y" THEN GO TO 5090
5100 BORDER 2 INPUT "" PAPER 2 FOR a=5 TO 21 PRINT AT a,0,, NEXT a
5110 PRINT AT 7,0,"The idea of this old          mathematical puzzle is to sort  out into numerical order the     numbers 0 to 9.
5120 PRINT '"" You do this by reversing       from 1 to 10 digits counting      from the left (the digits are     labelled 0 to 9).
5140 PRINT AT 21,0, PAPER 0,"     Press any key
5150 PAUSE 0
5160 BORDER 1 INPUT "", PAPER 1 FOR a=5 TO 21 PRINT AT a,0,, NEXT a
5170 PRINT AT 5,0,"For example, if the numbers are 8176502349 your first move might be to get the zero onto the lefthand edge. You do this by         reversing the first 6 digits.The computer will do this when you    type the digit below the 6th box"
5175 PRINT INK 7''"25 is the maximum number of      turns allowed.", INK 6 '"Don't worry if you don't get it at first, you'll soon get the    hang of it.", PAPER 0,AT 21,0,"      Press any key to start
5200 PAUSE 0 RETURN
```

Solgar
by A Wiseman

Book Ends

Book *The On-Line Handbook* **Price** £4.95 **Micro** Any **Supplier** Fontana 8 Grafton St London W1X 3LE

Before you get to the serious stuff here, you will have to wade through page after page of 'Gosh! Hey! Wow!' about how you can, "explore the vast universe of electronic information

Having got this out of the way however, Hammond gets down to some hard facts, from making up your RS232 cable, to logging on to *News, Lexis* and *Blaise* in between, you will be given information on calling up *Dial-your-match*, an American Lonely Hearts facility, as well as pages on Prestel Compunet and Micronet, and a quick run-down on searching techniques

The layout is attractive, with the pages of text being broken up by many little boxes, containing extra snippets of information under the cute title of *Log-On Message*

In sum, the author seems much happier when dealing with American systems – which should please the half-dozen people who own a suitable modem and can afford to log-on! The book is really aimed at professional users of computer information services who anyway will have their own sources of information It's good, though, to have important phone numbers and addresses all in one book

Tony Bridge

Book *Getting to Know Your Sinclair QL* **Price** £7.95 **Micro** QL **Supplier** Duckworth, The Old Piano Factory, 43 Gloucester Crescent, London NW1 7DY

The Sinclair QL has given rise to a new type of introductory guide which concentrates not on basic Basic, but on how to use the micro and accompanying suite of Psion programs from first principles.

The style is matter of fact and calmly reassuring, with the emphasis on practicalities such as making back-up cartridges

It is not a desperately heavy book and I was surprised that tape vulnerability warnings omitted mention of magnetic fields

At times there is a realistic cynicism about the QL's potential, but oddly no mention at all of Quill's notorious slowness

However, small business users with no computing experience need not fear a flood of jargon

John Minson

Four unputdownable books to make your Commodore unswitchoffable

Discover all the Commodore Books that will really help you get the most from your C16, Plus 4 'or good old 64...' follow the flow to find out the best buys for you and your Commodore...

SUNSHINE

First, what's your computer?

This way for Commodore 64 owners and to three great books

This way for the new C16 and Plus4 and your beginners' guide

Brian Lloyd has written the definitive book for everyone starting to use the superb new Commodore C16 and Plus4 micros You'll soon be able to get programming in BASIC, and at the end of a great read, you'll be well on your way to producing hi res graphics and doing some very neat disk file handling, for instance all without getting defeated by needless technicalities The Commodore C16/Plus4 Companion is a must for every owner and user, and it's only £5 95

Now, what's your interest?

Like to learn Logo the language that s beyond mere BASIC?

If you want to make music look no further

Here's how to program and play your 64 like a fine instrument

And here your 64's a synthesized sound centre

Inside every Commodore C64 sits SID, the unique and very powerful sound Interface Device Understand and make good use of SID and you ve got a wonderfully musical micro Ian Waugh s book lets you use SID to the fullest, with programs to produce chorus, echo, polyphony even sound effects Start playing around with your 64, and let it make music for you The book s only £6 95, too

Concentrating on the Commodore C64 as a controller or peripheral to other music-making goodies, Mark Jenkins — technical editor of Melody Maker — has produced a superb new book that lets you into all the secrets of the 64's very powerful sound generation system At only £6 95, its novel approach is a must for both musicians and micro enthusiasts

There's no doubt that everyone's talking about Logo — and here's your chance as a Commodore 64 owner to discover what all the fuss is about Logo helps you liberate the real potential of your 64, creating great sounds, super graphics and the most effective sprites you've ever seen Once you've used Logo, there's no going back to Basic! Boris Allen's book will cost you just £6 95

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Please send me the following book(s) for the Commodore

______ copies of the Commodore C16/Plus4 Companion at £5 95 + 60p p&p each

______ copies of Building with Logo on the Commodore 64 at £6 95 + 60p p&p each

______ copies of Commodore C64 Music at £6 95 + 50p p&p each

______ copies of Electronic Music on the Commodore 64 at £6 95 + 60p p&p each

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Infinite lives

I'm afraid that I can't postpone it any longer; after all these weeks of peace Miner Willy has reared his ugly head again. First of all comes a story that will seem horribly familiar to Spectrum owners You see, apparently there's a screen on the Commodore version that no-one can complete so that it is impossible to finish the game Can you believe it? (Let's have a competition to see who can be the first to find the impossible screen on the Amstrad and MSX.)

The screen in question is the wine cellar and I rang Software Projects to see if they could give any Pokes to rectify matters, but at the time they didn't know how Possibly by the time you read this there will have been a letter published from them with the appropriate answer

In the meantime I've had an awful lot of cries for help from people desperate for the infinite lives on the Commodore version of the game. Despite putting out a call for this many weeks ago, it was only the other day that a letter arrived from Mr D Bracher of Preston giving this short routine '*Load 1,1* (enter), *Poke 16424, 255* (enter), *Sys 16384* (enter)" Now let's have some *Manic Miner* Pokes for the Dragon, especially for Peter Quinn of Liverpool.

Now some of you may remember that a while ago I asked if any hackers were sharp enough to use the spare Ram locations in the Spectrum *Jet Set Willy* to add an extra room The winner by default, is Mr A M Davies of 1 Heol-Y-Craig, Crynant, Neath SA10 8TF who has sent in the listing below. To enter it type *Clear 24000* (enter), *Load "" Code* (enter) and load the JSW tape Then type *Clear 32767* (enter) and type in the listing and Run it. If it doesn't finish with an OK message, check the listing for mistakes and try again. The new version can be saved as *Save "jsw" Code 32768,32768* To run the new game type *Randomise Usr 33792* Mr Davies kindly offers to explain further how he did it to anyone who wants to get in touch.

```
10 DATA 170,170,170,170,170,17
0,170,170,22,170,128,10,170,170,
168,2,22,170,128,0,0,0,0,2,150,1
70,128,0,0,0,0,2,150,170,128,0,0
,0,0,2,150,2,128,0,0,0,0,2,150,0
,0,0,0,0,0,2,150,0,3,3,1,0,64,2,
150,6,149,85,64,0,1,66,150,2,128
,0,0,0,0,6,150,66,128,0,0,2,0,2,
150,2,128,0,0,0,2,2,150,6,128,0,
0,0,0,2,148,2,128,0,0,0,0,2,128,
2,176,0,0,0,0,2,170,170,170,170,
66,170,170,170
20 DATA 32,32,32,32,32,32,32,0
0,101,100,105,99,97,116,101,100,
32,116,111,32,80,67,87,32,32,32,
32,32,32,32,32,32,0,0,0,0,0,0,0,
0,0,4,255,60,130,146,130,60,255,
0,13,154,89,154,89,154,89,154,65
,2,0,0,0,16,56,84,146,124,7,0,3,
0,12,0,48,0,192,3,255,255,255,25
5,255,255,255,255,0,89,95,5
30 DATA 1,212,95,5,1,0,0,0,0,0
,0,0,0,0,0,55,0,0,0,0,0,0,41,50,
75,15,0,0,0,0,0,0,0,0,0,0,0,0
40 DATA 170,170,170,170,2,170,
170,170,170,170,170,170,2,170,17
0,170,160,0,0,0,4,0,0,10,160,0,0
,0,64,0,0,0
50 FOR f=0 TO 255· READ a: POK
E 61184+f,a  NEXT f
60 AESTORE 40  FOR f=0 TO 31:
READ a  POKE 57056+f,a  NEXT f
55 POKE 35699,0. POKE 58001,47
70 POKE 34476,195  POKE 34477,
202. POKE 34476,135
```

Finally on this subject, we've had a letter from Craig Davies of Blackpool who offers a whole selection of new Spectrum Pokes for the dreaded game Since the subject is getting a bit old hat, the only *one* we will print is *Poke 36543,32* which lets you jump up one block of hard ground making certain screens much easier and safer However, Craig's very enjoyable letter did include some genuine treasures including this routine to allow infinite lives and time on TLL by Vortex. Edit these lines in the header – 20 DATA 55, 62, 255, 21, 33, 0, 64, 17, 156, 191 205, 86 5, 62, 0, 50, 190, 138, 0, 15, 132, 201, 50 For n-65423 to 65444; 3000 Randomise Usr 65423

Regarding *Moon Alert* by Ocean, for a bit of fun "you can Poke to the high score sheet from location 26371 to 26607, the message of congratulations is at 44340 and movement routines are at 35110 If you *Poke 35115,255* you will move left at 100 mph! There is a problem that you are often killed for no reason [sic!] when doing this" Paul and 'friend' also go into the *Pyjamarama* Hall of Fame

Paul's top games are *Cyclone* by Vortex and *Starstrike* by Real Time, whilst he warns us to avoid *Byte-Bitten* by Firebird, *Factory Breakout* by Poppysoft and *Rapscallion* by Bug Byte

We are searching for the top UK computer games player – the best there is!

The very best of Britain's game players will get to fight it out on a number of top secret new games – scheduled for release in the autumn.

Here's how it works

Study the table below and look at the column for the machine you have – these are the games you'll need to master. Send your high scores in on the form below making sure that your scores are authenticated by a responsible individual signing the form. Any score achieved using technical short-cuts – such as infinite lives Pokes – will not be accepted.

Between now and September Tony Kendle will be keeping you up to date in the *Arcade Avenue* page with just who has the scores to beat. Then in September the top three scorers on each machine will battle it out for a place in the final and the chance to be the first to play our top secret games.

	Commodore	BBC	Spectrum	Amstrad
Game 1	Suicide Express	Elite	Technician Ted	Sorcery
Game 2	Beach Head	Jet Pac	3D Star Strike	Splat!
Game 3	Shoot the Rapids	Chuckie Egg	Cyclone	Manic Miner

Game Wizard Entry Form

Micro . . .

Game 1 score . . .

Game 2 score.

Game 3 score.

Name . . .

Address . . .

Your signature .

Witness's signature

Tir na Nog

Before we get on to *Tir na Nog*, that wonderful game from Gargoyle Games, let me correct a slip that I made recently in the Corner of 28th February. I was talking of *Eureka!* – Stuart Lorimer wanted help in this adventure and was willing to give help in return. His address, which was omitted (probably some gremlin in the works) is 62 Devonshire Road, Aberdeen, AB1 6X2.

Mr Anon Anon (well, it takes all sorts!) writes *'I think it's time that you did a piece on* Tir na Nog, *possibly the greatest adventure out* ' This opinion of the adventure is echoed, more openly, by Andrew Hartley of Carnforth, who says, *'I have found it one of the most playable of adventures Even when you are stuck for something to do you can still move about* the Land of Youth *collecting and dropping* objects *until an idea comes to mind* ' And Alan and Daphne Davis, old and trusted friends of the Elf, say, *'What appeals so strongly about this game is the curiously different puzzles you have to solve, combined with a quite compelling atmosphere Discoveries in this world are really exciting (getting into the Ice Cave had or jumping about like idiots) Unlike* Valhalla, Tir na Nog *offers eminently solvable puzzles – a bit of thought works wonders* '

So, several recommendations there, and they are not the only readers to tell the Grand Elf about this great game Those adventurers who, because of their partiality towards text games may have been put off this one, can rest assured that the puzzles in *Tir na Nog* are the equal of any elsewhere To play the game properly, most correspondents recommend proper mapping and this is quite easily achieved given *the* pause feature in the game

Andrew Hartley says that the *'next step is to associate the locked doors with their corresponding keys. All the symbols on the doors give clues to the keys required to open them* ' This view is supported by everyone else, and both Alan Davis and Andrew appended a long list of these symbols and their meanings Most are fairly self explanatory (like the Y, meaning the catapult and the 8 for the honeycomb), while a couple are more obscure The Davis's are stumped on the meaning of the N, which Andrew reveals stands for the egg – so you get the picture (which is another clue!)

Having mapped and made sense of the doors, it's time to complete *the* series of tasks required of you, in order to obtain the pieces of *the* seal of Calum While *there* are four pieces of the seal, and four tasks involved, *there* are a score of secondary tasks which should keep the player busy for a long, long while The task is set by one of the Deities behind certain doors, or by decoding a message on a stone (which may also be revealed by dropping certain items by the stone – in this game, *everything must be tried)* Upon completion of the task, you may be given a clue to a secret door, or a magical object

But let Alan Davis give you the flavour of the game, and talk you through the completion of one task obtaining Nuada's Sword

'Help yourself to some bones from somewhere and go to the far NW of Badhelm. Near the 8 door (round the corner) is a tunnel to Dun Domnuil, where you'll find the X door – go in and meet Domnuil who'll ask you to appease the ravens Pick up the honeycomb from the road near here, and leave Dun Domnuil Now go to Stormbase in the NE corner. In the far NE there's another tunnel with a feather inside – get this and return to the B door in Badhelm. Go in (honeycomb needed) and drop the feather at Bading's shrine It disappears and you're presented with an oak leaf, which you must then take back to Domnuil as proof of your success, and he'll give you – Nuada's Sword!'

Of course, all this takes some while, and you may be forgiven for giving up after being set upon by the Sidhe time after time, and having to restart This seems, at times, a very unfair aspect of the game and not really adding any atmosphere, although I suppose it concentrates *the* mind and confuses the player's attempts at mapping. The Davis' nearly threw their copy away, until they found *'The Bug! If you press Symbol Shift or Caps Shift and 6 immediately after being bopped, and then select Option 1, you will reappear in the same place, although you will now have to pick up your possessions* ' This hint convinced the Grand Elf to try his hand again at the game, and it does indeed make all the difference

Clues may be gleaned from all sorts of sources in this game, but the eye oracle likes Feldspar, quartz, flint and mine! And, to answer a problem that one or two people have had, *to* get into An Lin, the net, *you* must first obtain the sting from the * door in Sligo Warrens (have the ice with *you*). Take this to the 'curly blob – looks like a sting' door in Glasmarch in the south-east to gain entrance to An Lin

Another regular Corner reader is Ron Smith, and he, like Alan Davis, has performed all the tasks necessary to obtain the four pieces of the seal but is now at a loss *to* know what is the next step! He has found 75 doors (8 of which are invisible) and 63 objects available. Incidentally, Ron is willing to give help and advice to other struggling players, and you can send your SAE to him at 11 Essex Road, Rushden, Northants, NN10 0LG

Now some help is needed. Anon Anon, like the Grand Elf, can't get past Nathair, the Fire Lizard, without getting roasted What's the answer? *Also, if you* know how to re-unite the fragments of the Seal of Calum for the lightening of the burdens of the world and Cuchulainn's lasting glory, let me know!

We've run out of space again, I'm afraid, and there's just time to quote from Andrew Hartley again, who, among several other hints, gives this one to those who may be looking for *Dagda's* Cauldron

'Two half-torcs are needed, the first half behind a secret doorway in Tir Clachan *and the second half being buried in* Lon Liath. *The sign is a treasure map* '

My thanks *to* all *those* who have given me invaluable information on this most intriguing adventure

Adventure Helpline

Going bananas? If you are stuck in an Adventure with nowhere to turn do not despair – help is at hand

Fill in the coupon, explaining your problem send it to us and a fellow adventurer may be able to help

Remember – the system only works if those adventurers who have solved the puzzles get in touch Every week is Save An Adventurer Today (SAAT) week!

Adventure .... on (Micro) ....

Problem ....

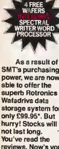
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This series of articles is designed for novice and experienced Adventurers alike Each week Tony Bridge will be looking at different Adventures and advising you on some of the problems and pitfalls you can expect to encounter So, if you have an Adventure you want reviewed or if you are stuck in an Adventure you cannot progress any further write to Tony Bridge Adventure Corner *Popular Computing Weekly* 12-13 Little Newport Street, London WC2H 3LD



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Peek & Poke



Out in the cold

Mrs M Furlonger, of Aldershot, writes

Q **Please could you let me know whether there are any programs available for the Commodore 16. I bought the starter pack with four games but no one has been able to tell me where to get any more software from. Would I have been better buying a Commodore 64?**

A Ah, what it is to have the benefit of hindsight! As you will have read, Commodore have announced that they will be producing a 'super' version of the 64. This almost certainly means that the independent software companies will concentrate on the 64 and the new machine. This may mean that the 16 is likely to be left out in the cold. However, there are a few companies like Romik, Melbourne House, Anirog as well as Commodore themselves who have produced programs for the C16 who may continue to do so – for a while at least.

Back-up copies

Jason Stanley, of Weston Super Mare writes

Q **I own a 48K Spectrum and am thinking of buying a microdrive. Could you please tell me if it is possible to make back-up copies of my games onto microdrive cartridges, if so could you tell me which of these back-up copiers you recommend? Also, are there many games available on cartridge for the Spectrum?**

A Yes, it is possible to copy software from cassette to microdrive. A number of companies do in fact produce such software. However, doing so is actually in breach of the laws of copyright. For this reason *PCW* does not carry any advertisements for these or any other copy software. Sorry about that. The short answer to your second question is ... not a lot! Very few of the independent software companies have really taken to the microdrive and as a result very little software has appeared in this form. The same is true for the KCM cartridges, which again have been largely neglected by everyone except Psion. You should note though that some recent commercial software does have an option to save the program to microdrive.

Missing parts

Garry Thompson, of Wolviston, Cleveland, writes

Q **Over the past month I have been writing a machine code game for the Spectrum. It was very near completion and I was very pleased with it. Then I tried to save the program. When it was half way through the Spectrum crashed, and the tape ran over the program before I could stop it. However, all that is gone is the header and the low 'whir' that produces the cyan and red colour on the screen. Is there any way to load in the 'iddle diddle iddle' on its own?**

A What you need to do is to reconstruct the missing parts of your tape. Obviously you should not use the same tape for this purpose, you don't want to risk futher loss of your program.

The steps to take in this reconstruction are –

1. Issue a *Save* command for a non-existant program making sure that you specify the same loading address and length as the actual program.
2. Stop the tape when the header, the 'whir' and part of this 'null' program have been saved.
3. Issue a *load* for your program in the normal way.
4. When *loading*, stop the dummy tape after the second header signal is received (the wide bars). You will have to be quite quick at this.
5. Put your 'lost' program tape into the cassette, and press play.

If you are lucky, and none of your code has been overwritten, then you should be able to save your program properly, in the usual way.

In future you should try to use different sides of a cassette to hold different versions of a program you are working on, or even different cassettes.

Strange occurrence

T J Varnoe, of Reading, writes

Q **I've owned a Spectrum for a couple of years and thought I knew my way around the machine, but this one has me baffled!**

```
10 Let a$= "100 of any character"
20 Let a$=a$+a$
30 Goto 20
```

This gives the report 4 *Out of Memory* when the length of a$ is 12800 and the memory used is 13K. Why is this when there should be a further 28K of memory available?

A This seemingly strange occurrence has quite a simple explanation. The actual amount of free memory available after the program has failed is in fact 3,030 bytes and not the 28K you think is free.

This is because the program you are running has used up the 'missing' 24K in discarded versions of the variable a$. When a character variable is increased in length the Spectrum discards it and sets up a new version in a different area of storage. The old storage is no longer available to the programmer. If you add some lines to your test program you will be able to observe this effect. The lines to add are

```
15 Let i=0
28 Let i=i+ Len a$
```

Which issue?

K Smith, of Stockport, writes

Q **After reading your reply to Roberto Gorrara (Vol 3 No 38) on how to confirm what issue Spectrum he had, you told him to *Print-In* 16607 and if 191 came up it was issue 3, or if 255 came up it was issue 1 or 2. When I did this I got 63. I thought 'my god, what does this mean? I would appreciate your comments.**

A Just a few points on this (and other) seemingly strange phenomena.

The *Print-In* method does not produce the correct result if:

(a) there are any peripherals connected to the Spectrum.
(b) any key is being pressed.
(c) your machine has certain expansion Ram packs.

One last comment, the statement when executed on a Spectrum + also gives 191 (if all the above conditions do not apply).

Pascal compiler

Kathleen Ladizesky, of Leeds, writes

Q **I am looking for a *Pascal* compiler for the Commodore 64. I wonder if you can give me the names and addresses of suppliers of such a compiler and also the likely prices?**

A Adamsoft produce a *Pascal* Compiler for the Commodore 64 that costs £29.95 (disc version only). The compiler is called *Zoom Pascal* and is available from Adamsoft at 18 Norwich Avenue, Rochdale, Lancashire OL11 5JZ. Or you could telephone them on 0706-524304.

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Phil Rogers and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke*, *PCW*, 12-13 Little Newport Street, London WC2R 3LD

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Planet of Death on Spectrum. I can't get past the forcefield or get out of the jail I have the mirror lasergun, boots and gloves. A Tinworth 12 Princes Crescent North, Dollar Clackmannanshire Scotland FK14 7BH

System 1500 on Commodore 64. What instructions do you give the computer at the beginning of the game? J Denning 133 Morland Road Aldershot Hants GU11 2SC

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COMPUTER SWAP

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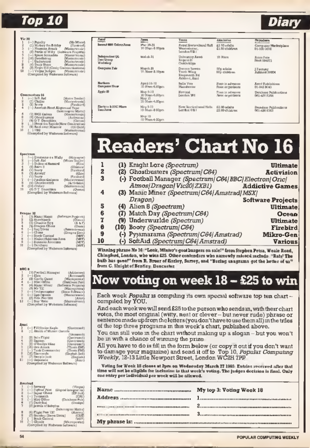
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3 (—) Phantom Attack (Mastertronic)
4 (8) Perils of Willy (Software Projects)
5 (—) Space Scramble (Mastertronic)
6 (10) Doodlebug (Mastertronic)
7 (—) Undermine (Mastertronic)
8 (4) Duck Shoot (Mastertronic)
9 (3) Flight 015 (Craig Communications)
10 (—) Vegas Jackpot (Mastertronic)
(Compiled by Websters Software)

Commodore 64
1 (—) Soft Aid (Micro Dealer)
2 (1) Chiller (Mastertronic)
3 (2) Booty (Firebird)
4 (—) Azimuth Head Alignment Tape (Interceptor Micro)
5 (3) BMX Racers (Mastertronic)
6 (6) Ghostbusters (Activision)
7 (4) D T Decathlon (Ocean)
8 ( ) Shoot the Rapids (New Generation)
9 (8) Raid over Moscow (US Gold)
10 ( ) 1999 (Mastertronic)
(Compiled by Websters Software)

Spectrum
1 (—) Everyone's a Wally (Micromega)
2 (—) Soft Aid (Micro Dealer)
3 (—) Dukes of Hazzard (Elite)
4 (8) Bairn 8 (Ultimate)
5 (1) Booty (Firebird)
6 (3) Airwolf (Elite)
1 (1) Booty (Firebird)
7 (—) Finders Keepers (Mastertronic)
8 (4) Ghostbusters (Activision)
9 (10) Chiller (Mastertronic)
10 (8) D T Decathlon (Ocean)
(Compiled by Websters Software)

Dragon 32
1 (1) Manic Miner (Software Projects)
2 (2) Hunchback (Ocean)
3 (5) Chuckie Egg (A & F)
4 (9) Dragon Chess (Oasis)
5 (—) Bug Diver (Mastertronic)
6 (—) Chess (Dragon Data)
7 (—) Stock Control (MST)
8 (—) Mailer/Address Area (MST)
9 (—) Business Accounts (MST)
10 (—) Database (MST)
(Compiled by Websters Software)

BBC B
1 (1) Football Manager (Addictive)
2 (—) Elite (Acornsoft)
3 (8) Castle Quest (Micropower)
4 (—) Mini Office (Database Publications)
5 (4) Manic Miner (Software Projects)
6 (5) Mr EE (Micropower)
7 (—) Endgamester (Soon Software)
8 (—) Spectipede (Mastertronic)
9 (7) Polo Position (Atari)
10 (—) Star Wars (Mastertronic)
(Compiled by Websters Software)

Atari
1 (—) F15/Strike Eagle (Centresoft)
2 (1) Attack of Mutant Camels (Llamasoft)
3 (2) Solo Flight (Centresoft)
4 (3) Zaxxon (Centresoft)
5 (8) O'Reillys Mine (Centresoft)
6 (10) Ore Attack (Thorn EMI)
7 (—) Tank Commander (Thorn EMI)
8 (10) Diamonds (English Soft)
9 (7) Steeple Jack (English)
10 (—) Galaxians (Atari)
(Compiled by Websters Software)

Amstrad
1 (—) Sorcery (Virgin)
2 (—) Fighter Pilot (Digital Integration)
3 (—) Super Chess (CP Soft)
4 (—) Tournament (CRL)
5 (—) Mini Office (Database Publications)
6 (1) Dark Star (Design)
7 (3) Jewels of Babylon (Interceptor Micro)
8 (6) Flight Path 737 (Anirog)
9 (7) Snooker (Steve Davis) (CDS)
10 ( ) Stock Control (MST)
11 (—) Ghouls (Micropower)
(Compiled by Websters Software)

Event	Dates	Venue	Admission	Organisers
Second 6800 Colour Event	Mar 30-31 10.00am-6.00pm	Royal Horticultural Hall Westminster, London SW1	£2.50 adults £1.50 children	Computer Marketplace 01-930 1612
Independent QL User Group Workshop	March 31	University Arms Regent St Cambridge	10.30am	Brian Pain (Bath 58427)
Computer Fair	March 31 10 Noon-5.00pm	Duncan Towers Youth Wing Kingsworth Rd Ashford, Kent	50p adults 30p children	J Fenway Ashford 30804
Northern Computer Show	April 16-18 10.00am-6.00pm	Belle Vue Manchester	Free in advance from organisers	Reed Exhibitions 01-942 8040
Apple 85	May 9-10 10.00am-6.00pm May 11 10.00am-4.00pm	Novotel London W6	Free in advance from organisers	Database Publications 061-456 8383
Electron & BBC Micro User Show	May 9-11 10.00am-6.00pm May 12 10.00am-4.00pm	New Horticultural Halls London SW1	£3.00 adults £2.00 children	Database Publications 061-456 8383

Readers' Chart No 16

1	(1)	Knight Lore *(Spectrum)*	**Ultimate**
2	(2)	Ghostbusters *(Spectrum/C64)*	**Activision**
3	(-)	Football Manager *(Spectrum/C64/BBC/Electron/Oric/Atmos/Dragon/Vic20/ZX81)*	**Addictive Games**
4	(3)	Manic Miner *(Spectrum/C64/Amstrad/MSX/Dragon)*	**Software Projects**
5	(4)	Alien 8 *(Spectrum)*	**Ultimate**
6	(7)	Match Day *(Spectrum/C64)*	**Ocean**
7	(9)	Underwurlde *(Spectrum)*	**Ultimate**
8	(10)	Booty *(Spectrum/C64)*	**Firebird**
9	(-)	Pyjamarama *(Spectrum/C64/Amstrad)*	**Mikro-Gen**
10	(-)	SoftAid *(Spectrum/C64/Amstrad)*	**Various**

Winning phrase No 16: "Look, Minter's goat burgers on sale!" from Stephen Petsa, Weale Road, Chingford, London, who wins £25. Other contenders who narrowly missed include "Rats! The bulb has gone!" from R. Bruer of Horley, Surrey, and "Boring anagrams got the better of us" from C. Sleight of Bentley, Doncaster.

Now voting on week 18 – £25 to win

Each week *Popular* is compiling its own special software top ten chart – compiled by YOU.

And each week we will send £25 to the person who sends in, with their chart votes, the most original (witty, neat or clever – but never rude) phrase or sentence made up from the letters (you don't have to use them all) in the titles of the top three programs in this week's chart, published above.

You can still vote in the chart without making up a slogan – but you won't be in with a chance of winning the prize.

All you have to do is fill in the form below (or copy it out if you don't want to damage your magazine) and send it off to Top 10, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP.

Voting for Week 18 closes at 2pm on Wednesday March 27 1985. Entries received after that time will not be eligible for inclusion in that week's voting. The judges decision is final. Only one entry per individual per week will be allowed.

Name	**My top 3: Voting Week 18**
Address	1..
....	2..
....	3..
My phrase is:	

New Releases

TAKE-OFF

Flight Path 737 is the title of a program from Anirog that's been around for quite a while now – however, the company has recently converted it to the Spectrum – a machine not entirely lacking in flight simulators

There are really only two elements you need to discuss about a flight simulator, how good are the graphics outside the cockpit window and how realistic is it to fly, ie, how do the controls respond and what are they?

This one scores quite well in the latter and reasonably in the former You have to take off from an airfield and quickly surmount a number of high mountains then bring the plane down again in a safe landing The different skill levels determine how high the mountains are and the other problems, such as cross winds, you'll come across

There are plenty of controls, height, flaps, undercarriage, indicators of altitude, runway heading, speed and so on If you don't have a simulator for your Spectrum, this one is not bad, but up against competition like Psion's *Flight Simulation* and Digital Integration's *Fighter Pilot* I'm not sure there is really any reason to buy it.

ANIROG

FLIGHT PATH 737

ADVANCED PILOT TRAINER

SPECTRUM

Program *Flight Path*
Price *£5 95*
Micro *Spectrum*
Supplier *Anigrog*
Unit 10 Victoria
Industrial Park
Victoria Road
Dartford
Kent DA1 5AJ

OWN GOAL

Rocket Ball is a sort of *International Soccer* of the future from IJK Software – a company first known for producing some of the best Oric software *Rocket Ball* is a vicious team game that was first invented as part of the film *Rollerball* – the objective is to get the ball, by some means or other, into the other team's goal

The game looks very much *International Soccer* – no bad thing and plays in a similar way except that you are quite at liberty to barge other players (there are some tips in the explanatory blurb on the best way to barge without being barged) Basically, you grab the ball and run (skate on jet thingies, actually) as fast as you can, throwing the ball if all else looks like failing

The graphics are good, although the fact that the players skate avoids the need for complex leg animation It's fast and vicious and judging by the cheers and sounds of glee that greeted every bumped player (who sits head spinning on the ground looking sorry for him(her)self) this one is going to do very well indeed. A football style game with added violence – what more could you want?

Program *Rocket Ball*
Price *£7 95*
Micro *Commodore*
Supplier *IJK*
Unit 3c
Moorfields
Moor Park Avenue
Bispham
Blackpool
Lancs FY2 0JY

MOTLEY CREW

Talisman from Games Workshop is a substantial and complex arcade game which the company describes as the true successor to *Valhalla*. Certainly there are points of comparison. there are animated independent characters (animated meaning the shape can be moved left and right, not that its little legs move, however) pseudo independent characters with personalities, objects to be collected, text descriptions etc

But the connection with *Valhalla* is superficial Graphically the game is less detailed and the game style has far more to do with role-playing At the beginning you must choose your characters from the usual motley crew of wizards, thieves, princesses, dwarves, etc

The game consists of moving your character around various screens (30 beautiful graphic locations it says on the box) Once there, various things may occur and useful objects may be discovered. Getting anywhere in the adventure (as in life) is a matter of finding the right objects and meeting the right people at the right time Events like fights are protracted graphically with dust clouds flying



There is a lot to the game and it will need a lot of play before it can be really judged – I think it will appeal more to the classic role player than the animated movie fan and the graphics are not really a strong point of the game.

Program *Talisman*
Price *£7 95*
Micro *Spectrum*
Supplier *Games Workshop*
27-29 Sunbeam
Road
London NW10

This Week

Program	Type	Micro	Price	Supplier
Android One	Arc	Amstrad	£7.95	Vortex
Jetboot Jack	Arc	Amstrad CPC464	£8.95	English
Sir Lancelot	Arc	Amstrad CPC464	£6.95	Melbourne House
DFM Database	Ut	Amstrad CPC464	£7.95	Amsoft
Mystery of Java Star	Ad	Atari	£7.95	Shards
Arabian Nights	Arc	BBC B	£6.00	Interceptor
Tempest	Arc	BBC B	£9.95	Superior
Quick Thinking	Ed	BBC B	£7.95	Mirrorsoft
Twin Kingdom Valley	Ad	Commodore 16	£6.95	Bug Byte
Classic Adventure	Adv	Commodore 16	£9.95	Melbourne House
Wizard & Princess	Adv	Commodore 16	£5.95	Melbourne House
Catacombs	Arc	Commodore 16	£6.95	Anirog
Out on a Limb	Arc	Commodore 16	£6.95	Anirog
Las Vegas	S	Commodore 16	£6.95	Anirog
Grand Larceny	Ad	Commodore 64	£7.95	Melbourne House
The Hobbit (Disc)	Ad	Commodore 64	£17.95	Melbourne House

New Releases

IMPROVED

There is little new to say about *The Hobbit*. It is, was and always will be one of the best graphic adventures ever made, easily outclassing even those expensive American jobs on IBM PCs and the like. Countless versions have been released (well, nearly ten anyway) for various micros.

The Commodore version was originally released yonks ago and was roughly the same as the Spectrum version, now we have the Commodore disc version and it is significantly different and improved. Aside from the fact that you may have solved the tape version 27 times you might still find a reason to buy this disc-based edition.

The biggest change is in the graphics. These are held on the B side of the disc and are accessed as needed – they are superb, full of colour and detail and are loaded up in a few seconds. *Hobbit* program buffs have examined the adventure in every detail and will want to have precise details of what is new – for one thing there are more pictures.

Elrond is now found at a place called the last lonely house, a beautifully designed location of a cottage by a river. Here, as elsewhere, there is more text and horror of horrors, a musical soundtrack! To most adventurers the idea of music must appear like a nasty intrusion into the silent cerebral world of adventuring but it's very well done. In fact, I would say that the disc version of the Hobbit is distinctly improved, not obviously in fundamental detail about what you do in the game and where, but in most other respects it's positively elvish.

Program *The Hobbit (Disc)*
Price *£17.95*
Micro *Commodore (+ Disc)*
Supplies *Melbourne House, Castle Yard House, Castle Yard, Richmond, Surrey*

ON-LINE

There seems to be no limit to the enthusiasm for small Spectrum houses to produce machine code utility programs. Latest is from Roybot and it seems to have absolutely everything you could possibly want for machine code.

On one cassette is an assembler, disassembler, tester, debugger, and a learning aid with teach yourself machine code on-line – a program which shows you register effects and the like, as well as the overall title. There is a manual and much care has been taken over making the code as Basic-like as possible.

The manual is not, I think, for beginners, but for people willing to spend a bit of effort and looking for complete machine code toolbox this looks a good choice.

Program *Teach Yourself Machine Code*
Price *£7.95*
Micro *Spectrum*
Supplier *Roybot, 45 Hullbridge Rd, Rayleigh, Essex SS6 9NL*

Pick of the week

DEAD ENDS

Wriggler is an arcade maze game with a number of interesting features that looks as though it'll be a big hit when it's released this week. Essentially the game involves moving a little worm around a vast number of screens, collecting things and dodging ants, spiders and countless other beings that get to the planet surface.

Sounds naff, doesn't it? But it isn't. For a number of reasons I like the game a lot and it's a lot more original than it sounds. For one thing there is no right way through the mazes and to a certain extent you can choose to avoid those obstacles you find difficult and take on instead those you can manage. The fact that some of the sections are fiendishly complicated makes for an additional kind of challenge as well – it took me three goes before I got anywhere in the first section, the Garden.

Each section has different properties – the Garden is a maze full of misleading directions and dead ends. The Scrubland contains fewer nasties but is difficult to leave, the Underground is a *Miner*-like area where timing and accuracy become important as you find your way through miles of caves. Finally, the Mansion is a series of corridors surrounding a vast shaft.

The range of problems and the 250 locations lift this well above the norm. Add excellent sprite graphics (the spider is amazingly well animated and is not suitable for arachnophobes) and almost no colour resolution problems and you have a winner. My only complaint is that the tenth section takes too long.

Program *Wriggler*
Price *£5.95*
Micro *Spectrum*
Supplier *Romantic Robot, 77 Dyne Road, London NW6 7DR*

This Week

Jousts	Arc	Commodore 64	£6.95	IJK
Krazy Kar	Arc	Commodore 64	£6.95	IJK
Rocket Ball	Arc	Commodore 64	£6.95	IJK
Las Vegas	S	Commodore 64	£6.95	Anirog
Tower of Evil	Arc	Commodore 16	£5.95	Creative Sparks
Strategy Games 1	S	Dragon 32	£4.95	Volcano Soft
Star Seeker	Ed	Electron	£8.95	Mirrorsoft
Typing Tutor	Ut	Sinclair QL	£24.95	Computer One
Talisman	Adv	Spectrum	£7.95	Games Workshop
Bruce Lee	Arc	Spectrum	£7.95	US Gold
Pete n' Barry	Arc	Spectrum	£6.90	Impact
Stay Kool	Arc	Spectrum	£6.95	Bug Byte
Wriggler	Arc	Spectrum	£5.95	Romantic Robot
Las Vegas	S	Vic 20	£6.95	Anirog

Key **Ad** – adventure; **Arc** – arcade; **Ed** – education; **S** – strategy simulation; **Ut** – Utility

SUCCESSFUL

I haven't found many positive things to say about CRL games in the past but *Formula One* is a really good strategy game with lots of graphics. The idea, obviously, is to win championships and have a successful racing team

Like all management games it comes down to various different screens of information, where you make decisions on drivers and cars, training, technical details and so on – alloting financial resources as best you can. In *Formula One* these sections occur with a lot of colour and graphic designs to retain the interest. As a straight management game it could be called a success.

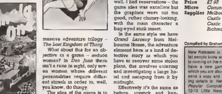
However, like *Football Manager* there is a major part of the game where the actual event for which you've been preparing your team occurs – the race. This is well done with the cars whizzing past the screen to goodish sound effects and various messages in ticker tape giving you the state of the race. From time to time a pit stop is necessary

As management games go it's one of the best.

Program *Formula One*
Price *£5 95*
Micro *Spectrum*
Supplier *CRL*
CRL House
9 Kings Yard
Carpenters Road
London E15 2HD

MANIPULATED

Maybe French computer buffs are special. I've always found that the average games player wants most in life either to achieve Supergalactic Captain at some megazap, or to find the mystic runes that open the sacred chests of the lost temple of Tharg in the massive adventure trilogy – *The Lost Kingdom of Tharg*.



What about this for an objective in a game – seduce women? In *Don Juan* there isn't a rune in sight, only seven women whose different personalities require different stimuli in order to, well, you know, do thingy.

The idea of the game is to 'use charm, psychology and imagination to find the key words' which will 'capture the hearts (nudge nudge) of the seven beauties'

Obviously the whole concept is appallingly sexist – it also implies that women have to be persuaded, tricked, cajoled and manipulated and that this is the proper function of men. I suppose that once, somewhere along the line there was quite a neat idea – a game based on the objective of discovering somebody's personality?

I bet you we never get sent cheat routines for this one

Program *Don Juan*
Price *£5 95*
Micro *Oric*
Supplier *110 bis, rue de*
General Leclerc
93506 Pantin
France

BUG-EYED

Zim Sala Bim was a funny adventure – although technically rather innovative with a mixture of joystick and text commands controlling graphic events on screen and animated effects, it didn't do well. I had reservations – the game idea was excellent but the graphics were not too good, rather clumsy-looking, with the main character a bug-eyed stick insect.

In the same style we have *Grand Larceny* from Melbourne House, the adventure element here is a kind of detective story in which you have to recover some stolen plans, this involves entering and investigating a large hotel and escaping from it by midnight.

Effectively it's the same as before, joystick and keyboard controls move another bug-eyed stick insect-like man around a scrolling screen. A quick play suggests the adventure could be quite fun, I spent quite a while figuring out what the girl winking at the window meant, but the graphics are still naff

I think the problem may be to do with the fact that all the shapes seem to be user-defined rather than smooth sprites, a graphic designer would help too. Almost great, almost dreadful.

Program *Grand Larceny*
Price *£7 95*
Micro *Commodore 64*
Supplier *Melbourne House*
Castle Yard House
Castle Yard
Richmond Surrey

Compiled by Graham Taylor

New Releases is designed to let people know what software is coming on the market. If you have a new game or utility which you are about to release send a copy and accompanying details to New Releases *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD

This Week

Ansoft Brentwood House 169 Kings Road Brentwood Essex 0277 230222 **Anirog** Victoria Industrial Park Victoria Road Dartford Kent OA1 5AJ 0322 92513 **Bug Byte** Mulberry House Canning Place, Liverpool L1 8JB 051-709 7071 **Computer One** Science Park Milton Road, Cambridge **Creative Sparks** Thompson House 296 Farnborough Road Farnborough, Hants 0252 543333 **English** Box 43 Manchester M60 3AD 061 835 1358 **Games Workshop**, 27/29 Sunbeam Road London NW10 6JP **IJK** Unit 3c Moorfields, Moor Park Avenue, Bispham, Blackpool, Lancs FY2 0JY 0253 55282 **Impact** 2 New Street, Cullompton, Devon EX15 1HA. 0884 38312. **Interceptor Micro's** Lindon House, The Green Tadley Hampshire 07356 71143 **Melbourne House** 39 Milton Trading Estate Abingdon, Oxon OX14 4TD 0235 835001 **Mirrorsoft** Mirror Group Holborn Circus London EC1P 1DQ 01-353 0246 **Romantic Robot** 77 Dyne Road, London NW6 7DS 01-625 9463 **Shards** 189 Eton Road, Ilford, Essex IG1 2QU 01-514 4871 **Superior** Regent House, Skinner Lane, Leeds LS7 1AX 0532 459453 **US Gold** Unit 10 The Parkway Ind Centre Heneage Street Birmingham B7 4LY 021 359 3020 **Volcano Soft**, 12 Helod Close Ponthir Newport Gwent NP6 1GI **Vortex** 24 Kansas Avenue, Off South Langworthy Road Salford M5 2GL 061 872 4747



Wrong message

The Greeks had a good idea. you find a place where several people can gather, call it an Agora, and stand up and make a speech. About anything, in fact. Standing on the Greek equivalent of a soap-box, you could complain about the Persians, the quality of the slaves, poor harvests, and even boast about your own brilliance

Later on, newspapers were provided for the same purpose Provided someone turned up at the Agora, or someone bought the newspaper, there could be an exchange of views

In more recent times, you had only to put a card in the window of the local corner shop to be sure that someone would see it and respond, as anyone who visits Popular's offices in Soho will discover

In the second half of the 20th century, someone had the brilliant idea of electronic bulleon boards (I suspect it was a major shareholder in British Telecom, as they're the only people who benefit) Anyone with a computer and a modem can dial up and leave a message that will soon get a response – at least, that is the idea

Unfortunately, it doesn't work like that Even if you disregard the unpleasant element who leave obscene graffiti before the Sys bulletin board op can remove them, have you ever tried to use a bulletin board as it was intended?

1 There's usually only one phone line in, so the number is always engaged
2 The system refuses to recognise your password, and you have to register again.
3 If you do manage to get through, you spend several minutes wading through pages until you reach the message section
4 Your last message has been removed due to a system crash.
5. The time limit cuts you off just as you are on the point of saving the message you've just spent five minutes entering
6. You discover you've just had a 15 minute long-distance phone call for nothing
7 You spend the rest of the evening being ignored by the rest of the family for kicking the cat in frustration

I find Prestel does occasionally have its uses for instance, when I need to know a train time or the state of Acorn shares. It also has to be admitted that their electronic mail system does work fairly well (provided you don't mind being hacked by the Duke of Edinburgh, that is).

When we have knowledge databases that can be accessed like encyclopedias, then I shall consider subsidising Busby's electronic wing a little more Until then for sending messages, an old-fashioned phone call seems to do the job a lot more reliably.

John Scriven

Evens chance

Puzzle No 150

Sammy Sharp was at it again!

This time it was a little dice gamble that he had dreamed up

"Here I have five dice," ran his line of patter "Exactly the same as those you have at home except that instead of a 'six' face, they have blanks which score zero '

Having gained the attention of the crowd, he continued, "Simply throw the dice, and multiply the numbers thrown. The maximum score possible is 3125, but I'll pay odds of ten to one on any score over one thousand."

Of course if you were wise you would realise that even a single 'zero score would wipe out your entire total but can you say just what the chances of winning are?

Solution to Puzzle No 145

The ages are 6 & 14, 8 & 13, and 3 &15, the sums of squares being 232, 233 and 234 respectively Therefore the sisters are:
Brigitte and Eriza (6 & 14) who live at 232
Clara and Divinia (8 & 13) who live at 233
Abigail and Flora (3 & 15) who live at 234

```
10 DIM AGE(6)
20 LET N=
30 FOR F=1 TO 6:AGE(F)=0:NEXT F
40 LET A=N
50 GOSUB 170
60 IF Y<>0 THEN LET AGE(1)=P:LET AGE(2)=SQ ELSE
   GOTO 150
70 LET A=N+1
80 GOSUB 170
90 IF Y<>0 THEN LET AGE(3)=P:LET AGE(4)=SQ ELSE
   GOTO 150
100 LET A=N+2
110 GOSUB 170
120 IF Y<>0 THEN LET AGE(5)=P:LET AGE(6)=SQ ELSE
   GOTO 150
130 FOR K=1 TO 6:PRINT AGE(K);:NEXT K
140 PRINT
150 N=N+1
160 GOTO 30
170 FOR P=1 TO A/ :Y=0
180 LET Q=A-(P*P):IF Q<0 THEN GOTO 220
190 LET SQ=SQR(Q):LET SQ=VAL(STR$(SQ))
200 IF SQ=INT(SQ)THEN LET X=SQ:LET Y=P:GOTO 220
210 NEXT P
220 RETURN
```

The program tests each successive address in sequence to determine which three consecutive integers are each the sums of two squares As we are told that all six ages are different, the calculation proceeds until a set of six values are found without any duplication.

Winner of Puzzle 145

The winner is John C Findlay of Sunderland, Tyne & Wear who receives £10

The Hackers



Meet the Gang!



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